

Evidence Base for Collaborative Care

A Curated List of Reviews, Research, and Practice-Based Articles

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1) Foundational Evidence Base and Reviews

1.1. Archer J, Bower P, Gilbody S, et al. Collaborative care for depression and anxiety problems.

Cochrane Database of Systematic Reviews 2012, Issue 10. Art. No.: CD006525. DOI:

[10.1002/14651858.CD006525.pub2](https://doi.org/10.1002/14651858.CD006525.pub2)

Summary: In a Cochrane systematic review of 79 clinical trials of Collaborative Care, the authors concluded Collaborative Care is associated with significant improvement in depression and anxiety outcomes compared with usual care, and represents a useful addition to clinical pathways for adult patients with depression and anxiety.

Scientific Abstract:

Background: Common mental health problems, such as depression and anxiety, are estimated to affect up to 15% of the UK population at any one time, and health care systems worldwide need to implement interventions to reduce the impact and burden of these conditions. Collaborative care is a complex intervention based on chronic disease management models that may be effective in the management of these common mental health problems.

Objectives: To assess the effectiveness of collaborative care for patients with depression or anxiety.

Search methods: We searched the following databases to February 2012: The Cochrane Collaboration Depression, Anxiety and Neurosis Group (CCDAN) trials registers (CCDANCTR-References and CCDANCTR-Studies) which include relevant randomised controlled trials (RCTs) from MEDLINE (1950 to present), EMBASE (1974 to present), PsycINFO (1967 to present) and the Cochrane Central Register of Controlled Trials (CENTRAL, all years); the World Health Organization (WHO) trials portal (ICTRP); ClinicalTrials.gov; and CINAHL (to November 2010 only). We screened the reference lists of reports of all included studies and published systematic reviews for reports of additional studies.

Selection criteria: Randomised controlled trials (RCTs) of collaborative care for participants of all ages with depression or anxiety.

Data collection and analysis: Two independent researchers extracted data using a standardised data extraction sheet. Two independent researchers made 'Risk of bias' assessments using criteria from The Cochrane Collaboration. We combined continuous measures of outcome using standardised mean differences (SMDs) with 95% confidence intervals (CIs). We combined dichotomous measures using risk ratios (RRs) with 95% CIs. Sensitivity analyses tested the robustness of the results.

Main results: We included seventy-nine RCTs (including 90 relevant comparisons) involving 24,308 participants in the review. Studies varied in terms of risk of bias. The results of primary analyses demonstrated significantly greater improvement in depression outcomes for adults with depression treated with the collaborative care model in the short-term (SMD -0.34, 95% CI -0.41 to -0.27; RR 1.32, 95% CI 1.22 to 1.43), medium-term (SMD -0.28, 95% CI -0.41 to -0.15; RR 1.31, 95% CI 1.17 to 1.48), and long-term (SMD -0.35, 95% CI -0.46 to -0.24; RR 1.29, 95% CI 1.18 to 1.41). However, these significant benefits were not demonstrated into the very long-term (RR 1.12, 95% CI 0.98 to 1.27). The results also demonstrated significantly greater improvement in anxiety outcomes for adults with anxiety treated with the collaborative care model in the short-term (SMD -0.30, 95% CI -0.44 to -0.17; RR 1.50, 95% CI 1.21 to 1.87), medium-term (SMD -0.33, 95% CI -0.47 to -0.19; RR 1.41, 95% CI 1.18 to 1.69), and long-term (SMD -0.20, 95% CI -0.34 to -0.06; RR 1.26, 95% CI 1.11 to 1.42). No comparisons examined the effects of the intervention on anxiety outcomes in the very long-term. There was evidence of benefit in secondary outcomes including medication use, mental health quality of life, and patient satisfaction, although there was less evidence of benefit in physical quality of life.

Authors' conclusions: Collaborative care is associated with significant improvement in depression and anxiety outcomes compared with usual care, and represents a useful addition to clinical pathways for adult patients with depression and anxiety.

1.2. Gilbody S, Bower P, Fletcher J, Richards D, Sutton AJ. Collaborative care for depression: a cumulative meta-analysis and review of longer-term outcomes. *Arch Intern Med.* 2006;166(21):2314-21.

Summary: The first systematic review and meta-analysis of Collaborative Care trials, showing that in 37 randomized trials, Collaborative Care was significantly more effective than usual care and improved depression outcomes at 6 months and for up to 5 years.

Scientific Abstract:

Background: Depression is common in primary care but is suboptimally managed. Collaborative care, that is, structured care involving a greater role of nonmedical specialists to augment primary care, has emerged as a potentially effective candidate intervention to improve quality of primary care and patient outcomes. **Methods:** To quantify the short-term and longer-term effectiveness of collaborative care compared with standard care and to understand mechanisms of action by exploring between-study heterogeneity, we conducted a systematic review of randomized controlled trials that compared collaborative care with usual primary care in patients with depression. We searched MEDLINE (from the beginning of 1966), EMBASE (from the beginning of 1980), CINAHL (from the beginning of 1980), PsycINFO (from the beginning of 1980), the Cochrane Library (from the beginning of 1966), and DARE (Database of Abstracts of Reviews of Effectiveness) (from the beginning of 1985) databases from study inception to February 6, 2006. **Results:** We found 37 randomized studies including 12 355 patients with depression receiving primary care. Random effects meta-analysis showed that depression outcomes were improved at 6 months (standardized mean difference, 0.25; 95% confidence interval, 0.18-0.32), and evidence of longer-term benefit was found for up to 5 years (standardized mean difference, 0.15; 95% confidence interval, 0.001-0.31). When exploring determinants of effectiveness, effect size was directly related to medication compliance and to the professional background and method of supervision of case managers. The addition of brief psychotherapy did not substantially improve outcome, nor did increased numbers of sessions. Cumulative meta-analysis showed that sufficient evidence had emerged by 2000 to demonstrate the statistically significant benefit of collaborative care. **Conclusions:** Collaborative care is more effective than standard care in improving depression outcomes in the short and longer terms. Future research needs to address the implementation of collaborative care, particularly in settings other than the United States.

1.3. Huffman JC, Niazi SK, Rundell JR, Sharpe M, Katon WJ. Essential articles on collaborative care models for the treatment of psychiatric disorders in medical settings: a publication by the Academy of Psychosomatic Medicine Research and Evidence-Based Practice Committee. *Psychosomatics.* 2014;55:109-122.

Summary: A collection and summary of essential articles on collaborative care.

Scientific Abstract:

Background: Collaborative care interventions for psychiatric disorders combine several components integrated into the medical setting: (1) systematic psychiatric assessment, (2) use of a nonphysician care manager to perform longitudinal symptom monitoring, treatment interventions, and care coordination, and (3) specialist-provided stepped-care recommendations. Collaborative care interventions have now been evaluated in a wide spectrum of

care settings and offer great promise as a way of increasing quality of patient care, improving health of populations, and reducing health care costs.

Methods: A systematic search of PubMed/MEDLINE databases was performed for publications between January 1970 and May 2013 to identify articles describing collaborative care and related interventions. Identified articles were then evaluated independently by multiple reviewers for quality and importance; additional articles were identified by searching reference lists and through recommendations of senior content-matter experts. The articles considered to be both of high quality and most important were then placed into categories and annotated reviews performed.

Results: Over 600 articles were identified of which 67 were selected for annotated review. The results reported in these articles indicate that collaborative care interventions for psychiatric disorders have been consistently successful in improving key outcomes in both research and clinical intervention studies; cost analyses also suggest that this model is cost effective.

Conclusions: Collaborative care models for psychiatric disorders are likely to serve an increasingly large role in health care given their effect on patient and population outcomes and their focus on integration of care.

1.4. Panagioti M, Bower P, Kontopantelis E, et al. Association between chronic physical conditions and the effectiveness of collaborative care for depression: an individual participant data meta-analysis. *JAMA Psychiatry*. 2016;73:978-989.

Summary: The authors reviewed 31 clinical trials and found that number of and type of chronic physical conditions did not influence treatment effect of collaborative care, showing evidence that collaborative care is effective for people with depression and chronic physical health conditions.

Scientific Abstract:

Importance: Collaborative care is an intensive care model involving several health care professionals working together, typically a physician, a case manager, and a mental health professional. Meta-analyses of aggregate data have shown that collaborative care is particularly effective in people with depression and comorbid chronic physical conditions. However, only participant-level analyses can rigorously test whether the treatment effect is influenced by participant characteristics, such as chronic physical conditions.

Objective: To assess whether the effectiveness of collaborative care for depression is moderated by the presence, type, and number of chronic physical conditions.

Data sources: Data were obtained from MEDLINE, EMBASE, PubMed, PsycINFO, CINAHL Complete, and Cochrane Central Register of Controlled Trials, and references from relevant systematic reviews. The search and collection of eligible studies was ongoing until May 22, 2015.

Study selection: This was an update to a previous meta-analysis. Two independent reviewers were involved in the study selection process. Randomized clinical trials that compared the effectiveness of collaborative care with usual care in adults with depression and reported measured changes in depression severity symptoms at 4 to 6 months after randomization were included in the analysis. Key search terms included depression, dysthymia, anxiety, panic, phobia, obsession, compulsion, posttraumatic, care management, case management, collaborative care, enhanced care, and managed care.

Data extraction and synthesis: Individual participant data on baseline demographics and chronic physical conditions as well as baseline and follow-up depression severity symptoms were requested from authors of the eligible studies. One-step meta-analysis of individual participant data using appropriate mixed-effects models was performed.

Main outcomes and measures: Continuous outcomes of depression severity symptoms measured using self-reported or observer-rated measures.

Results: Data sets from 31 randomized clinical trials including 36 independent comparisons (N = 10 962 participants) were analyzed. Individual participant data analyses found no significant interaction effects, indicating that the presence (interaction coefficient, 0.02 [95% CI, -0.10 to 0.13]), numbers (interaction coefficient, 0.01 [95% CI, -0.01 to 0.02]), and types of chronic physical conditions do not influence the treatment effect.

Conclusions and relevance: There is evidence that collaborative care is effective for people with depression alone and also for people with depression and chronic physical conditions. Existing guidance that recommends limiting collaborative care to people with depression and physical comorbidities is not supported by this individual participant data meta-analysis.

1.5. Moriarty AS, Coventry PA, Hudson JL, et al. The role of relapse prevention for depression in collaborative care: A systematic review. *J Affect Disord.* 2020;15:618-644.

Summary: The authors reviewed 93 clinical trials of collaborative care with over half including monitoring or relapse prevention, and concluded the “established key features of collaborative care, particularly structured management plans and scheduled patient follow-up, facilitated the delivery of these relapse prevention strategies.”

Scientific Abstract:

Background: Relapse (the re-emergence of depression symptoms before full recovery) is common in depression and relapse prevention strategies are not well researched in primary care settings. Collaborative care is effective for treating acute phase depression but little is known about the use of relapse prevention strategies in collaborative care. We undertook a systematic review to identify and characterise relapse prevention strategies in the context of collaborative care.

Methods: We searched for Randomised Controlled Trials (RCTs) of collaborative care for depression. In addition to published material, we obtained provider and patient manuals from authors to provide more detail on intervention content. We reported the extent to which collaborative care interventions addressed four relapse prevention components.

Results: 93 RCTs were identified. 31 included a formal relapse prevention plan; 42 had proactive monitoring and follow-up after the acute phase; 39 reported strategies for optimising sustained medication adherence; and 20 of the trials reported psychological or psycho-educational treatments persisting beyond the acute phase or focussing on long-term health/relapse prevention. 30 (32.3%) did not report relapse prevention approaches.

Limitations: We did not receive trial materials for approximately half of the trials, which limited our ability to identify relevant features of intervention content.

Conclusion: Relapse is a significant risk amongst people treated for depression and interventions are needed that specifically address and minimise this risk. Given the advantages of collaborative care as a delivery system for depression care, there is scope for more consistency and increased effort to implement and evaluate relapse prevention strategies.

1.6. Thota AB, Sipe TA, Byard GJ, Zometa CS, Hahn RA, McKnight-Eily LR, 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):525-38.

Summary: A systematic review of 69 studies of Collaborative Care (an update to 6.2 Gilbody, et al.) found robust evidence for the effectiveness of Collaborative Care.

Scientific Abstract:

CONTEXT: To improve the quality of depression management, collaborative care models have been developed from the Chronic Care Model over the past 20 years. Collaborative care is a multicomponent, healthcare system-level intervention that uses case managers to link primary care providers, patients, and mental health specialists. In addition to case management support, primary care providers receive consultation and decision support from mental health specialists (i.e., psychiatrists and psychologists). This collaboration is designed to (1) improve routine screening and diagnosis of depressive disorders; (2) increase provider use of evidence-based protocols for the proactive management of diagnosed depressive disorders; and (3) improve clinical and community support for active client/patient engagement in treatment goal-setting and self-management. **EVIDENCE ACQUISITION:** A team of subject matter experts in mental health, representing various agencies and institutions, conceptualized and conducted a systematic review and meta-analysis on collaborative care for improving the management of depressive disorders. This team worked under the guidance of the Community Preventive Services Task Force, a nonfederal, independent, volunteer body of public health and prevention experts. Community Guide systematic review methods were used to identify, evaluate, and analyze available evidence. **EVIDENCE SYNTHESIS:** An earlier systematic review with 37 RCTs of collaborative care studies published through 2004 found evidence of effectiveness of these models in improving depression outcomes. An additional 32 studies of collaborative care models conducted between 2004 and 2009 were found for this current review and analyzed. The results from the meta-analyses suggest robust evidence of effectiveness of collaborative care in improving depression symptoms (standardized mean difference [SMD]=0.34); adherence to treatment (OR=2.22); response to treatment (OR=1.78); remission of symptoms (OR=1.74); recovery from symptoms (OR=1.75); quality of life/functional status (SMD=0.12); and satisfaction with care (SMD=0.39) for patients diagnosed with depression (all effect estimates were significant). **CONCLUSIONS:** Collaborative care models are effective in achieving clinically meaningful improvements in depression outcomes and public health benefits in a wide range of populations, settings, and organizations. Collaborative care interventions provide a supportive network of professionals and peers for patients with depression, especially at the primary care level.

1.7. Unützer J, Katon W, Callahan CM, Williams JW, Jr., Hunkeler E, Harpole L, et al. Collaborative-care management of late-life depression in the primary care setting. JAMA. 2002;288(22):2836-45.

Summary: The primary results of the IMPACT Collaborative Care clinical trial which included n=1801 older adults with depression and showed treatment with Collaborative Care more than doubled the effectiveness of depression treatment.

Scientific Abstract:

CONTEXT: Few depressed older adults receive effective treatment in primary care settings. **OBJECTIVE:** To determine the effectiveness of the Improving Mood-Promoting Access to Collaborative Treatment (IMPACT) collaborative care management program for late-life depression. **DESIGN:** Randomized controlled trial with recruitment from July 1999 to August 2001. **SETTING:** Eighteen primary care clinics from 8 health care organizations in 5 states. **PARTICIPANTS:** A total of 1801 patients aged 60 years or older with major depression (17%), dysthymic disorder (30%), or both (53%). **INTERVENTION:** Patients were randomly assigned to the IMPACT intervention (n = 906) or to usual care (n = 895). Intervention patients had access for up to 12 months to a

depression care manager who was supervised by a psychiatrist and a primary care expert and who offered education, care management, and support of antidepressant management by the patient's primary care physician or a brief psychotherapy for depression, Problem Solving Treatment in Primary Care. MAIN OUTCOME MEASURES: Assessments at baseline and at 3, 6, and 12 months for depression, depression treatments, satisfaction with care, functional impairment, and quality of life. RESULTS: At 12 months, 45% of intervention patients had a 50% or greater reduction in depressive symptoms from baseline compared with 19% of usual care participants (odds ratio [OR], 3.45; 95% confidence interval [CI], 2.71-4.38; $P < .001$). Intervention patients also experienced greater rates of depression treatment (OR, 2.98; 95% CI, 2.34-3.79; $P < .001$), more satisfaction with depression care (OR, 3.38; 95% CI, 2.66-4.30; $P < .001$), lower depression severity (range, 0-4; between-group difference, -0.4; 95% CI, -0.46 to -0.33; $P < .001$), less functional impairment (range, 0-10; between-group difference, -0.91; 95% CI, -1.19 to -0.64; $P < .001$), and greater quality of life (range, 0-10; between-group difference, 0.56; 95% CI, 0.32-0.79; $P < .001$) than participants assigned to the usual care group. CONCLUSION: The IMPACT collaborative care model appears to be feasible and significantly more effective than usual care for depression in a wide range of primary care practices.

1.8. Unützer J, Schoenbaum M, Druss BG, Katon WJ. Transforming mental health care at the interface with general medicine: report for the Presidents Commission. Psychiatr Serv. 2006;57(1):37-47.

Summary: This report describes a background report prepared for the President's New Freedom Commission on Mental Health, and summarizes literature including on mental illness and the medical care system, barriers to effective care, quality improvement strategies, and key policy recommendations for overcoming barriers to use of evidence-based models including collaborative care.

Scientific Abstract:

This paper is based on a report commissioned by the Subcommittee on Mental Health Interface With General Medicine of the Presidents New Freedom Commission on Mental Health. Although mental and medical conditions are highly interconnected, medical and mental health care systems are separated in many ways that inhibit effective care. Treatable mental or medical illnesses are often not detected or diagnosed properly, and effective services are often not provided. Improved mental health care at the interface of general medicine and mental health requires educated consumers and providers; effective detection, diagnosis, and monitoring of common mental disorders; valid performance criteria for care at the interface of general medicine and mental health; care management protocols that match treatment intensity to clinical outcomes; effective specialty mental health support for general medical providers; and financing mechanisms for evidence-based models of care. Successful models exist for improving the collaboration between medical and mental health providers. Recommendations are presented for achieving high-quality care for common mental disorders at the interface of general medicine and mental health and for overcoming barriers and facilitating use of evidence-based quality improvement models.

1.9. Fortney JC, Pyne JM, Edlund MJ, et al. A randomized trial of telemedicine-based collaborative care for depression. J Gen Intern Med. 2007;22:1086-1093.

Summary: The Telemedicine Enhanced Antidepressant Management (TEAM) trial enrolled $n=395$ patients from small Veterans' Affairs (VA) primary care clinics lacking on-site psychiatrists. Collaborative care was delivered remotely by off-site RN care managers and psychiatrists who were located at the

same academic health center. Care managers provided care management by phone every two weeks including assessment using semi-structured scripts, with an average of 7 phone contacts per patient, and met face-to-face with psychiatrists for case review. Those randomized to collaborative care showed an increased rate of depression improvement at 6 months, with twice as many individuals experiencing depression remission at 12 months, compared to usual care.

Scientific Abstract:

Background: Evidence-based practices designed for large urban clinics are not necessarily portable into smaller isolated clinics. Implementing practice-based collaborative care for depression in smaller primary care clinics presents unique challenges because it is often not feasible to employ on-site psychiatrists.

Objective: The purpose of the Telemedicine Enhanced Antidepressant Management (TEAM) study was to evaluate a telemedicine-based collaborative care model adapted for small clinics without on-site psychiatrists.

Design: Matched sites were randomized to the intervention or usual care.

Participants: Small VA Community-based outpatient clinics with no on-site psychiatrists, but access to telepsychiatrists. In 2003-2004, 395 primary care patients with PHQ9 depression severity scores ≥ 12 were enrolled, and followed for 12 months. Patients with serious mental illness and current substance dependence were excluded.

Measures: Medication adherence, treatment response, remission, health status, health-related quality of life, and treatment satisfaction.

Results: The sample comprised mostly elderly, white, males with substantial physical and behavioral health comorbidity. At baseline, subjects had moderate depression severity (Hopkins Symptom Checklist, SCL-20 = 1.8), 3.7 prior depression episodes, and 67% had received prior depression treatment. Multivariate analyses indicated that intervention patients were more likely to be adherent at both 6 (odds ratio [OR] = 2.1, $p = .04$) and 12 months (OR = 2.7, $p = .01$). Intervention patients were more likely to respond by 6 months (OR = 2.0, $p = .02$), and remit by 12 months (OR = 2.4, $p = .02$). Intervention patients reported larger gains in mental health status and health-related quality of life, and reported higher satisfaction.

Conclusions: Collaborative care can be successfully adapted for primary care clinics without on-site psychiatrists using telemedicine technologies.

1.10. Pomerantz AS, Corson JA, Detzer MJ. The challenge of integrated care for mental health: leaving the 50 minute hour and other sacred things. J Clin Psychol Med Settings. 2009;16(1):40-6.

Summary: This narrative article describes challenges to integrated care to those new to working in integrated care settings, and experiences of a clinic system.

Scientific Abstract:

A growing body of research has demonstrated the effectiveness of integrating mental/behavioral healthcare with primary care in improving health outcomes. Despite this rich literature, such demonstration programs have proven difficult to maintain once research funding ends. Much of the discussion regarding maintenance of integrated care has been focused on lack of reimbursement. However, provider factors may be just as important, because integrated care systems require providers to adopt a very different role and operate very differently from traditional mental health practice. There is also great variability in definition and operationalization of integrated care. Provider concerns tend to focus on several factors, including a perceived loss of autonomy, discomfort with the hierarchical nature of medical care and primary care settings, and enduring beliefs about what constitutes

"good" treatment. Providers may view integrated care models as delivering substandard care and passively or actively resist them. Dissemination of available data regarding effectiveness of these models is essential (e.g. timeliness of treatment, client satisfaction). Increasing exposure and training in these models, while maintaining the necessary training in traditional mental health care is a challenge for training at all levels, yet the challenge clearly opens new opportunities for psychology and psychiatry.

1.11. Croghan T, Brown J. Integrating Mental Health Treatment Into the Patient Centered Medical Home. (Prepared by Mathematica Policy Research under Contract No. HHS2902009000191 TO2.) Rockville, MD: Agency for Healthcare Research and Quality., 2010 Contract No.: AHRQ Publication No. 10-0084-EF.

Summary: A comprehensive multi-chapter report on the patient centered medical home and strategies of integrating mental health treatment.

Scientific Abstract:

Efforts to improve the quality and efficiency of primary care have recently focused on the concept of the Patient Centered Medical Home (PCMH). Given that primary care serves as a main venue for providing mental health treatment, it is important to consider whether the adoption of the PCMH model is conducive to delivery of such treatment. This paper identifies the conceptual similarities in and differences between the PCMH and current strategies used to deliver mental health treatment in primary care. Even though adoption of the PCMH has the potential to enhance delivery of mental health treatment in primary care, several programmatic and policy actions are needed to facilitate integration of high-quality mental health treatment within a PCMH.

1.12. Katon W, Unützer J, Wells K, Jones L. Collaborative depression care: history, evolution and ways to enhance dissemination and sustainability. Gen Hosp Psychiatry. 2010;32(5):456-64.

Summary: A review authored by four keynote speakers at the 2009 NIMH Mental Health Services Meeting, describing history and current strategies for development and implementation of Collaborative Care, including new demonstration projects.

Scientific Abstract:

OBJECTIVE: To describe the history and evolution of the collaborative depression care model and new research aimed at enhancing dissemination. **METHOD:** Four keynote speakers from the 2009 NIMH Annual Mental Health Services Meeting collaborated in this article in order to describe the history and evolution of collaborative depression care, adaptation of collaborative care to new populations and medical settings, and optimal ways to enhance dissemination of this model. **RESULTS:** Extensive evidence across 37 randomized trials has shown the effectiveness of collaborative care vs. usual primary care in enhancing quality of depression care and in improving depressive outcomes for up to 2 to 5 years. Collaborative care is currently being disseminated in large health care organizations such as the Veterans Administration and Kaiser Permanente, as well as in fee-for-services systems and federally funded clinic systems of care in multiple states. New adaptations of collaborative care are being tested in pediatric and ob-gyn populations as well as in populations of patients with multiple comorbid medical illnesses. New NIMH-funded research is also testing community-based participatory research approaches to collaborative care to attempt to decrease disparities of care in underserved minority populations. **CONCLUSION:**

Collaborative depression care has extensive research supporting the effectiveness of this model. New research and demonstration projects have focused on adapting this model to new populations and medical settings and on studying ways to optimally disseminate this approach to care, including developing financial models to incentivize dissemination and partnerships with community populations to enhance sustainability and to decrease disparities in quality of mental health care.

1.13. Roy-Byrne P, Craske MG, Sullivan G, Rose RD, Edlund MJ, Lang AJ, et al. Delivery of Evidence-Based Treatment for Multiple Anxiety Disorders in Primary Care: A Randomized Controlled Trial. JAMA. 2010;303(19):1921-8.

Summary: This report describes the primary results of a large (n=1004) randomized trial of Collaborative Care treatment for patients with anxiety disorders in 17 primary care clinics, compared to usual care, and showed treatment with Collaborative Care was associated with significantly better patient outcomes at follow-up.

Scientific Abstract:

Context: Improving the quality of mental health care requires moving clinical interventions from controlled research settings into real-world practice settings. Although such advances have been made for depression, little work has been performed for anxiety disorders. Objective To determine whether a flexible treatment-delivery model for multiple primary care anxiety disorders (panic, generalized anxiety, social anxiety, and posttraumatic stress disorders) would be better than usual care (UC). Design, Setting, and Patients: A randomized controlled effectiveness trial of Coordinated Anxiety Learning and Management (CALM) compared with UC in 17 primary care clinics in 4 US cities. Between June 2006 and April 2008, 1004 patients with anxiety disorders (with or without major depression), aged 18 to 75 years, English- or Spanish-speaking, were enrolled and subsequently received treatment for 3 to 12 months. Blinded follow-up assessments at 6, 12, and 18 months after baseline were completed in October 2009. Intervention: CALM allowed choice of cognitive behavioral therapy (CBT), medication, or both; included real-time Web-based outcomes monitoring to optimize treatment decisions; and a computer-assisted program to optimize delivery of CBT by nonexpert care managers who also assisted primary care clinicians in promoting adherence and optimizing medications. Main Outcome Measures: Twelve-item Brief Symptom Inventory (BSI-12) anxiety and somatic symptoms score. Secondary outcomes included proportion of responders (\geq 50% reduction from pretreatment BSI-12 score) and remitters (total BSI-12 score $<$ 6). Results A significantly greater improvement for CALM vs UC in global anxiety symptoms was found (BSI-12 group mean differences of -2.49 [95% confidence interval {CI}, -3.59 to -1.40], -2.63 [95% CI, -3.73 to -1.54], and -1.63 [95% CI, -2.73 to -0.53] at 6, 12, and 18 months, respectively). At 12 months, response and remission rates (CALM vs UC) were 63.66% (95% CI, 58.95%-68.37%) vs 44.68% (95% CI, 39.76%-49.59%), and 51.49% (95% CI, 46.60%-56.38%) vs 33.28% (95% CI, 28.62%-37.93%), with a number needed to treat of 5.27 (95% CI, 4.18-7.13) for response and 5.50 (95% CI, 4.32-7.55) for remission. Conclusion: For patients with anxiety disorders treated in primary care clinics, CALM compared with UC resulted in greater improvement in anxiety symptoms, depression symptoms, functional disability, and quality of care during 18 months of follow-up.

1.14. Zatzick DF, Roy-Byrne P, Russo J, et al. A randomized effectiveness trial of stepped collaborative care for acutely injured trauma survivors. Arch Gen Psychiatry. 2004;61:498-506.

Summary: The authors report results of a clinical trial including n=120 individuals hospitalized for care of acute injuries treated with Collaborative Care or usual care post hospital discharge, and found those receiving Collaborative Care has significantly better mental health outcomes including lower PTSD symptom severity and rates of alcohol abuse/dependence.

Scientific Abstract:

Context: Although posttraumatic stress disorder (PTSD) and alcohol abuse frequently occur among acutely injured trauma survivors, few real-world interventions have targeted these disorders.

Objective: We tested the effectiveness of a multifaceted collaborative care (CC) intervention for PTSD and alcohol abuse.

Design: Randomized effectiveness trial.

Participants: We recruited a population-based sample of 120 male and female injured surgical inpatients 18 or older at a level I trauma center.

Intervention: Patients were randomly assigned to the CC intervention (n = 59) or the usual care (UC) control condition (n = 61). The CC patients received stepped care that consisted of (1) continuous postinjury case management, (2) motivational interviews targeting alcohol abuse/dependence, and (3) evidence-based pharmacotherapy and/or cognitive behavioral therapy for patients with persistent PTSD at 3 months after injury.

Main outcome measures: We used the PTSD symptomatic criteria (PTSD Checklist) at baseline and 1, 3, 6, and 12 months after injury, and alcohol abuse/dependence (Composite International Diagnostic Interview) at baseline and 6 and 12 months after injury.

Results: Random-coefficient regression analyses demonstrated that over time, CC patients were significantly less symptomatic compared with UC patients with regard to PTSD ($P = .01$) and alcohol abuse/dependence ($P = .048$). The CC group demonstrated no difference (-0.07%; 95% confidence interval [CI], -4.2% to 4.3%) in the adjusted rates of change in PTSD from baseline to 12 months, whereas the UC group had a 6% increase (95% CI, 3.1%-9.3%) during the year. The CC group showed on average a decrease in the rate of alcohol abuse/dependence of -24.2% (95% CI, -19.9% to -28.6%), whereas the UC group had on average a 12.9% increase (95% CI, 8.2%-17.7%) during the year.

Conclusions: Early mental health care interventions can be feasibly and effectively delivered from trauma centers. Future investigations that refine routine acute care treatment procedures may improve the quality of mental health care for Americans injured in the wake of individual and mass trauma.

1.15. Katon W, Unützer J. Consultation psychiatry in the medical home and accountable care organizations: achieving the triple aim. *Gen Hosp Psychiatry*. 2011;33(4):305-10.

Summary: A focused summary of clinical epidemiology of patients with comorbid physical and psychiatric illnesses, Collaborative Care, and related health care policy.

Scientific Abstract:

We are in a time of increasing concern about unsustainable increases in health care costs to Medicare, Medicaid, employers and individuals. At the same time, more than half of patients with mental health needs do not receive care in any given year, and untreated mental disorders can be important drivers of high health care costs. As in the rest of health care, we are challenged with achieving the “triple aim” of improving access to care while at the same time improving quality and outcomes of care and reducing total health care costs. To achieve this triple aim, psychiatrists of the future will have to shift professional roles. In addition to traditional consultation liaison activities focused on individual patients in outpatient clinics or hospital settings, psychiatrists should have

important roles in monitoring behavioral health needs, treatments and treatment outcomes for defined populations of patients and providing supervision and guidance to interdisciplinary teams of primary care and behavioral health providers caring for a defined panel of patients.

1.16. Gilbody S, Lewis H, Adamson J, et al. Effect of collaborative care vs usual care on depressive symptoms in older adults with subthreshold depression: The CASPER Randomized clinical trial. *JAMA*. 2017;317:728-737.

Summary: The primary results of a clinical trial showed Collaborative Care for older adults with subthreshold depressive symptoms was associated with lower severity depressive symptoms at 4 months, and significantly decreased risk of onset of major depressive disorder at 12 months, compared to usual care.

Scientific Abstract:

Importance: There is little evidence to guide management of depressive symptoms in older people.

Objective: To evaluate whether a collaborative care intervention can reduce depressive symptoms and prevent more severe depression in older people.

Design, setting, and participants: Randomized clinical trial conducted from May 24, 2011, to November 14, 2014, in 32 primary care centers in the United Kingdom among 705 participants aged 65 years or older with Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition) subthreshold depression; participants were followed up for 12 months.

Interventions: Collaborative care (n=344) was coordinated by a case manager who assessed functional impairments relating to mood symptoms. Participants were offered behavioral activation and completed an average of 6 weekly sessions. The control group received usual primary care (n=361).

Main outcomes and measures: The primary outcome was self-reported depression severity at 4-month follow-up on the 9-item Patient Health Questionnaire (PHQ-9; score range, 0-27). Included among 10 prespecified secondary outcomes were the PHQ-9 score at 12-month follow-up and the proportion meeting criteria for depressive disorder (PHQ-9 score ≥ 10) at 4- and 12-month follow-up.

Results: The 705 participants were 58% female with a mean age of 77 (SD, 7.1) years. Four-month retention was 83%, with higher loss to follow-up in collaborative care (82/344 [24%]) vs usual care (37/361 [10%]). Collaborative care resulted in lower PHQ-9 scores vs usual care at 4-month follow-up (mean score with collaborative care, 5.36 vs with usual care, 6.67; mean difference, -1.31; 95% CI, -1.95 to -0.67; $P < .001$). Treatment differences remained at 12 months (mean PHQ-9 score with collaborative care, 5.93 vs with usual care, 7.25; mean difference, -1.33; 95% CI, -2.10 to -0.55). The proportions of participants meeting criteria for depression at 4-month follow-up were 17.2% (45/262) vs 23.5% (76/324), respectively (difference, -6.3% [95% CI, -12.8% to 0.2%]; relative risk, 0.83 [95% CI, 0.61-1.27]; $P = .25$) and at 12-month follow-up were 15.7% (37/235) vs 27.8% (79/284) (difference, -12.1% [95% CI, -19.1% to -5.1%]; relative risk, 0.65 [95% CI, 0.46-0.91]; $P = .01$).

Conclusions and relevance: Among older adults with subthreshold depression, collaborative care compared with usual care resulted in a statistically significant difference in depressive symptoms at 4-month follow-up, of uncertain clinical importance. Although differences persisted through 12 months, findings are limited by attrition, and further research is needed to assess longer-term efficacy.

1.17. Fortney JC, Pyne JM, Kimbrell TA, et al. Telemedicine-based collaborative care for posttraumatic stress disorder: a randomized controlled trial. *JAMA Psychiatry*. 2015;72:58-67.

Summary: The Telemedicine Outreach for PTSD (TOP) study compared remote collaborative care to usual care in 11 VA primary care clinics in individuals with PTSD. Offsite nurse care managers worked as part of a PTSD Care team (including a psychologist, pharmacist, and psychiatric consultant) co-located at VA Medical Centers. Care managers met face-to face with the collaborative care team for case review, and contacted patients by phone, and average of 14 contacts per patient, and used a web-based decision support system. Every 2 week phone contacts with patients included care managers assessing patient symptoms, problem-solving, coordinating care, and scheduling psychotherapy with the off-site psychologist. Patients receiving collaborative care experienced significantly greater reductions in PTSD symptoms at 6 and 12 months.

Scientific Abstract:

Importance: Posttraumatic stress disorder (PTSD) is prevalent, persistent, and disabling. Although psychotherapy and pharmacotherapy have proven efficacious in randomized clinical trials, geographic barriers impede rural veterans from engaging in these evidence-based treatments.

Objective: To test a telemedicine-based collaborative care model designed to improve engagement in evidence-based treatment of PTSD.

Design, setting, and participants: The Telemedicine Outreach for PTSD (TOP) study used a pragmatic randomized effectiveness trial design with intention-to-treat analyses. Outpatients were recruited from 11 Department of Veterans Affairs (VA) community-based outpatient clinics serving predominantly rural veterans. Inclusion required meeting diagnostic criteria for current PTSD according to the Clinician-Administered PTSD Scale. Exclusion criteria included receiving PTSD treatment at a VA medical center or a current diagnosis of schizophrenia, bipolar disorder, or substance dependence. Two hundred sixty-five veterans were enrolled from November 23, 2009, through September 28, 2011, randomized to usual care (UC) or the TOP intervention, and followed up for 12 months.

Interventions: Off-site PTSD care teams located at VA medical centers supported on-site community-based outpatient clinic providers. Off-site PTSD care teams included telephone nurse care managers, telephone pharmacists, telepsychologists, and telepsychiatrists. Nurses conducted care management activities. Pharmacists reviewed medication histories. Psychologists delivered cognitive processing therapy via interactive video. Psychiatrists supervised the team and conducted interactive video psychiatric consultations.

Main outcomes and measures: The primary outcome was PTSD severity as measured by the Posttraumatic Diagnostic Scale. Process-of-care outcomes included medication prescribing and regimen adherence and initiation of and adherence to cognitive processing therapy.

Results: During the 12-month follow-up period, 73 of the 133 patients randomized to TOP (54.9%) received cognitive processing therapy compared with 16 of 132 randomized to UC (12.1%) (odds ratio, 18.08 [95% CI, 7.96-41.06]; $P < .001$). Patients in the TOP arm had significantly larger decreases in Posttraumatic Diagnostic Scale scores (from 35.0 to 29.1) compared with those in the UC arm (from 33.5 to 32.1) at 6 months ($\beta = -3.81$; $P = .002$). Patients in the TOP arm also had significantly larger decreases in Posttraumatic Diagnostic Scale scores (from 35.0 to 30.1) compared with those in the UC arm (from 33.5 to 31.7) at 12 months ($\beta = -2.49$; $P = .04$). There were no significant group differences in the number of PTSD medications prescribed and adherence to medication regimens were not significant. Attendance at 8 or more sessions of cognitive processing therapy significantly predicted improvement in Posttraumatic Diagnostic Scale scores ($\beta = -3.86$ [95% CI, -7.19 to -0.54]; $P = .02$) and fully mediated the intervention effect at 12 months.

Conclusions and relevance: Telemedicine-based collaborative care can successfully engage rural veterans in evidence-based psychotherapy to improve PTSD outcomes.

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

Summary: The authors report primary results of a randomized trial of Collaborative Care for adolescents (ages 13-17) with depression in primary care, and found treatment with Collaborative Care doubled the effectiveness of depression treatment.

Scientific Abstract:

Importance: Up to 20% of adolescents experience an episode of major depression by age 18 years yet few receive evidence-based treatments for their depression.

Objective: To determine whether a collaborative care intervention for adolescents with depression improves depressive outcomes compared with usual care.

Design: Randomized trial with blinded outcome assessment conducted between April 2010 and April 2013.

Setting: Nine primary care clinics in the Group Health system in Washington State.

Participants: Adolescents (aged 13-17 years) who screened positive for depression (Patient Health Questionnaire 9-item [PHQ-9] score ≥ 10) on 2 occasions or who screened positive and met criteria for major depression, spoke English, and had telephone access were recruited. Exclusions included alcohol/drug misuse, suicidal plan or recent attempt, bipolar disorder, developmental delay, and seeing a psychiatrist.

Interventions: Twelve-month collaborative care intervention including an initial in-person engagement session and regular follow-up by master's-level clinicians. Usual care control youth received depression screening results and could access mental health services through Group Health.

Main outcomes and measures: The primary outcome was change in depressive symptoms on a modified version of the Child Depression Rating Scale-Revised (CDRS-R; score range, 14-94) from baseline to 12 months. Secondary outcomes included change in Columbia Impairment Scale score (CIS), depression response ($\geq 50\%$ decrease on the CDRS-R), and remission (PHQ-9 score < 5).

Results: Intervention youth ($n = 50$), compared with those randomized to receive usual care ($n = 51$), had greater decreases in CDRS-R scores such that by 12 months intervention youth had a mean score of 27.5 (95% CI, 23.8-31.1) compared with 34.6 (95% CI, 30.6-38.6) in control youth (overall intervention effect: $F_{2,747.3} = 7.24$, $P < .001$). Both intervention and control youth experienced improvement on the CIS with no significant differences between groups. At 12 months, intervention youth were more likely than control youth to achieve depression response (67.6% vs 38.6%, OR = 3.3, 95% CI, 1.4-8.2; $P = .009$) and remission (50.4% vs 20.7%, OR = 3.9, 95% CI, 1.5-10.6; $P = .007$).

Conclusions and relevance: Among adolescents with depression seen in primary care, a collaborative care intervention resulted in greater improvement in depressive symptoms at 12 months than usual care. These findings suggest that mental health services for adolescents with depression can be integrated into primary care.

1.19. Katon W, Lin EHB, Von Korff M, et al. Collaborative care for patients with depression and chronic illnesses. *N Engl J Med*. 2010;27:2611-2620.

Summary: The authors report primary results of a randomized trial comparing multi-condition Collaborative Care to usual care for patients with depression and diabetes and/or cardiovascular disease. Treatment with Collaborative Care was associated with significantly greater improvements in depression, and diabetes and cardiovascular disease measures, along with better quality of life and satisfaction with care.

Scientific Abstract:

Background: Patients with depression and poorly controlled diabetes, coronary heart disease, or both have an increased risk of adverse outcomes and high health care costs. We conducted a study to determine whether coordinated care management of multiple conditions improves disease control in these patients.

Methods: We conducted a single-blind, randomized, controlled trial in 14 primary care clinics in an integrated health care system in Washington State, involving 214 participants with poorly controlled diabetes, coronary heart disease, or both and coexisting depression. Patients were randomly assigned to the usual-care group or to the intervention group, in which a medically supervised nurse, working with each patient's primary care physician, provided guideline-based, collaborative care management, with the goal of controlling risk factors associated with multiple diseases. The primary outcome was based on simultaneous modeling of glycated hemoglobin, low-density lipoprotein (LDL) cholesterol, and systolic blood-pressure levels and Symptom Checklist-20 (SCL-20) depression outcomes at 12 months; this modeling allowed estimation of a single overall treatment effect.

Results: As compared with controls, patients in the intervention group had greater overall 12-month improvement across glycated hemoglobin levels (difference, 0.58%), LDL cholesterol levels (difference, 6.9 mg per deciliter [0.2 mmol per liter]), systolic blood pressure (difference, 5.1 mm Hg), and SCL-20 depression scores (difference, 0.40 points) ($P<0.001$). Patients in the intervention group also were more likely to have one or more adjustments of insulin ($P=0.006$), antihypertensive medications ($P<0.001$), and antidepressant medications ($P<0.001$), and they had better quality of life ($P<0.001$) and greater satisfaction with care for diabetes, coronary heart disease, or both ($P<0.001$) and with care for depression ($P<0.001$).

Conclusions: As compared with usual care, an intervention involving nurses who provided guideline-based, patient-centered management of depression and chronic disease significantly improved control of medical disease and depression.

2) Implementation and Practice-Based Evidence

2.1. Bauer AM, Azzone V, Goldman HH, Alexander L, Unutzer J, Coleman-Beattie B, et al. Implementation of collaborative depression management at community-based primary care clinics: an evaluation. Psychiatr Serv. 2011;62(9):1047-53.

Summary: This implementation evaluation showed variability in clinical outcomes across six community health centers implementing Collaborative Care.

Scientific Abstract:

Objective: This study evaluated a large demonstration project of collaborative care of depression at community health centers by examining the role of clinic site on two measures of quality care (early follow-up and appropriate pharmacotherapy) and on improvement of symptoms (score on Patient Health Questionnaire-9 reduced by 50% or ≤ 5).

Methods: A quasi-experimental study examined data on the treatment of 2,821 patients aged 18 and older with depression symptoms between 2006 and 2009 at six community health organizations selected in a competitive process to implement a model of collaborative care. The model's key elements were use of a Web-based disease registry to track patients, care management to support primary care providers and offer proactive follow-up of patients, and organized psychiatric consultation.

Results: Across all sites, a plurality of patients achieved meaningful improvement in depression, and in many sites, improvement occurred rapidly. After adjustment for patient characteristics, multivariate logistic regression models revealed significant differences across clinics in the probability of receiving early follow-up (range .34-.88) or

appropriate pharmacotherapy (range .27-.69) and in experiencing improvement (.36 to .84). Similarly, after adjustment for patient characteristics, Cox proportional hazards models revealed that time elapsed between first evaluation and the occurrence of improvement differed significantly across clinics ($p < .001$).

Conclusions: Despite receiving similar training and resources, organizations exhibited substantial variability in enacting change in clinical care systems, as evidenced by both quality indicators and outcomes. Sites that performed better on quality indicators had better outcomes, and the differences were not attributable to patients' characteristics.

2.2. Whitebird RR, Solberg LI, Jaekels NA, et al. Effective implementation of collaborative care for depression: what is needed? *Am J Manag Care*. 2014;20:699-707.

Summary: This report described evaluation of effective Collaborative Care implementation and found 9 important factors for successful Collaborative Care implementation including strong leadership support, and strong key personnel including a primary care champion and engaged psychiatric consultant, and well-defined care manager roles.

Scientific Abstract:

Objectives: To identify the care model factors that were key for successful implementation of collaborative depression care in a statewide Minnesota primary care initiative.

Study design: We used a mixed-methods design incorporating both qualitative data from clinic site visits and quantitative measures of patient activation and 6-month remission rates.

Methods: Care model factors identified from the site visits were tested for association with rates of activation into the program and remission rates.

Results: Nine factors were identified as important for successful implementation of collaborative care by the consultants who had trained and interviewed participating clinic teams, and rated according to a Likert Scale. Factors correlated with higher patient activation rates were: strong leadership support (0.63), well-defined and - implemented care manager roles (0.62), a strong primary care physician champion (0.60), and an on-site and accessible care manager (0.59). However, remission rates at 6 months were correlated with: an engaged psychiatrist (0.62), not seeing operating costs as a barrier to participation (0.56), and face-to-face communication (warm handoffs) between the care manager and primary care physician for new patients (0.54).

Conclusions: Care model factors most important for successful program implementation differ for patient activation into the program versus remission at 6 months. Knowing which implementation factors are most important for successful activation will be useful for those interested in adopting this evidence-based approach to improving primary care for patients with depression.

2.3. Bao Y, Druss BG, Jung HY, et al. Unpacking Collaborative Care for depression: examining two essential tasks for implementation. *Psychiatr Serv*. 2016;67:418-424.

Summary: This study involved analysis of observational data collected from community health centers in two counties in Washington State that had implemented Collaborative Care. The authors found that the care processes of care manager follow-up within four weeks of initial contact and psychiatric consultant case review were associated with greater likelihood of depression improvement, and care manager follow-up within four weeks of initial contact shorter time until improvement.

Scientific Abstract:

Objective: This study examined how two key process-of-care tasks of the collaborative care model (CCM) predict patient depression outcomes.

Methods: Registry data were from a large implementation of the CCM in Washington State and included 5,439 patient-episodes for patients age 18 or older with a baseline Patient Health Questionnaire-9 (PHQ-9) score of ≥ 10 and at least one follow-up contact with the CCM care manager within 24 weeks of initial contact. Key CCM tasks examined were at least one care manager follow-up contact within four weeks of initial contact and at least one psychiatric consultation between weeks 8 and 12 for patients not responding to treatment by week 8. Clinically significant improvement in depression symptoms was defined as achieving a PHQ-9 score of < 10 or a 50% or more reduction in PHQ-9 score compared with baseline. Bivariate and multivariate (logistic and proportional hazard models) analyses were conducted to examine how fidelity with either task predicted outcomes. All analyses were conducted with the original sample and with a propensity score-matched sample.

Results: Four-week follow-up was associated with a greater likelihood of achieving improvement in depression (odds ratio [OR]=1.63, 95% confidence interval [CI]=1.23-2.17) and a shorter time to improvement (hazard ratio=2.06, CI=1.67-2.54). Psychiatric consultation was also associated with a greater likelihood of improvement (OR=1.44, CI=1.13-1.84) but not with a shorter time to improvement. Propensity score-matched analysis yielded very similar results.

Conclusions: Findings support efforts to improve fidelity to the two process-of-care tasks and to include these tasks among quality measures for CCM implementation.

2.4. Moise N, Shah RN, Essock S, et al. Sustainability of collaborative care management for depression in primary care settings with academic affiliations across New York State.

Implement Sci. 2018;13:128. doi: 10.1186/s13012-018-0818-6.

Summary: The authors evaluated collaborative care implementation in 32 primary care clinics and found that clinics with higher care manager time and other investments in staffing FTE, and clinics meeting key process measures such as number of contacts per patient, had better depression improvement rates in patients and were more likely to sustain collaborative care after two years.

Scientific Abstract:

Background: In a large statewide initiative, New York State implemented collaborative care (CC) from 2012 to 2014 in 32 primary care settings where residents were trained and supported its sustainability through payment reforms implemented in 2015. Twenty-six clinics entered the sustainability phase and six opted out, providing an opportunity to examine factors predicting continued CC participation and fidelity.

Methods: We used descriptive statistics to assess implementation metrics in sustaining vs. opt-out clinics and trends in implementation fidelity 1 and 2 years into the sustainability phase among sustaining clinics. To characterize barriers and facilitators, we conducted 31 semi-structured interviews with psychiatrists, clinic administrators, primary care physicians, and depression care managers (24 at sustaining, 7 at opt-out clinics).

Results: At the end of the implementation phase, clinics opting to continue the program had significantly higher care manager full-time equivalents (FTEs) and achieved greater clinical improvement rates (46% vs. 7.5%, $p = 0.004$) than opt-out clinics. At 1 and 2 years into sustainability, the 26 sustaining clinics had steady rates of depression screening, staffing FTEs and treatment titration rates, significantly higher contacts/patient and improvement rates and fewer enrolled patients/FTE. During the sustainability phase, opt-out sites reported lower patient caseloads/FTE, psychiatry and care manager FTEs, and physician/psychiatrist CC involvement compared to sustaining clinics. Key barriers to

sustainability noted by respondents included time/resources/personnel (71% of respondents from sustaining clinics vs. 86% from opt-out), patient engagement (67% vs. 43%), and staff/provider engagement (50% vs. 43%). Fewer respondents mentioned early implementation barriers such as leadership support, training, finance, and screening/referral logistics. Facilitators included engaging patients (e.g., warm handoffs) (79% vs. 86%) and staff/providers (71% vs. 100%), and hiring personnel (75% vs. 57%), particularly paraprofessionals for administrative tasks (67% vs. 0%).

Conclusions: Clinics that saw early clinical improvement and who invested in staffing FTEs were more likely to elect to enter the sustainability phase. Structural rules (e.g., payment reform) both encouraged participation in the sustainability phase and boosted long-term outcomes. While limited to settings with academic affiliations, these results demonstrate that patient and provider engagement and care manager resources are critical factors to ensuring sustainability.

2.5. Beck A, Boggs JM, Alem A, et al. Large-Scale implementation of collaborative care management for depression and diabetes and/or cardiovascular disease. J Am Board Fam Med. 2018;31:702-711.

Summary: The authors conducted semi-structured interviews with clinicians from 8 health systems to understand factors influencing implementation of Collaborative Care. Factors influencing Collaborative Care implementation included clinician (physician and care manager) engagement and experience, team cohesion/trust, health system organizational challenges, use of a patient registry, Collaborative Care process measures such as frequency of care manager contact, and use of quality improvement reports.

Scientific Abstract:

Background: Collaborative care models have been shown to improve mental and physical health, but their effectiveness varies. Implementation science frameworks identify measures at the structural (eg, sociocultural context, public policies), organizational, provider, innovation, and patient levels that may facilitate or impede collaborative care effectiveness.

Objective: To describe commonalities and variation in multilevel measures associated with the implementation of Care of Mental, Physical, and Substance-Use Syndromes (COMPASS), a large-scale collaborative care intervention for depression, diabetes, and cardiovascular disease.

Design: Qualitative study using semi-structured descriptive data obtained from annual site visit reports and supplemental site surveys.

Participants: COMPASS care teams from 8 health care systems serving 3854 patients with active depression and poorly controlled diabetes and/or cardiovascular disease.

Intervention: COMPASS included weekly case reviews with a consulting physician and psychiatrist, a patient-tracking registry, and monitoring of hospital and emergency department use.

Main measures: Site visit reports were analyzed with Atlas.ti software to qualitatively describe implementation measures and their variation across sites.

Key results: Nine measures were identified that impacted implementation efforts across health systems: (1) challenges in health systems' organizational environments, (2) prior care coordination experience, (3) physician engagement, (4) care team trust and cohesion, (5) care manager training and experience, (6) patient enrollment length, attainment of clinical targets, and frequency/content of care manager contacts, (7) patient-tracking registries, (8) quality improvement and outcomes monitoring reports, and (9) patients' social needs.

Conclusions: Understanding multilevel measures impacting COMPASS implementation could increase the success of future collaborative care implementation efforts.

2.6. Powers DM, Bowen DJ, Arao RF, et al. Rural clinics implementing collaborative care for low-income patients can achieve comparable or better depression outcomes. *Fam Syst Health*. 2020;38:242-254.

Summary: Eight rural clinics implemented Collaborative Care and demonstrated that approximately 15% of the total clinic populations were treated with Collaborative Care, and that patients receiving Collaborative Care experienced clinically significant improvements in depression and reduction in suicidal ideation.

Scientific Abstract:

Introduction: The gap between depression treatment needs and the available mental health workforce is particularly large in rural areas. Collaborative care (CoCM) is an evidence-based approach that leverages limited mental health specialists for maximum population effect. This study evaluates depression treatment outcomes, clinical processes of care, and primary care provider experiences for CoCM implementation in 8 rural clinics treating low-income patients.

Method: We used CoCM registry data to analyze depression response and remission then used logistic regression to model variance in depression outcomes. Primary care providers reported their experiences with this practice change 18 months following program launch.

Results: Participating clinics enrolled 5,187 adult patients, approximately 15% of the adult patient population. Mean PHQ-9 depression score was 16.1 at baseline and 10.9 at last individual measurement, a statistically and clinically significant improvement (SD6.7; 95% CI [4.9, 5.3]). Suicidal ideation also reduced significantly. Multivariate logistic regression predicted the probability of depression response and remission after controlling for several demographic attributes and processes of care, showing a significant amount of variance in outcomes could be explained by clinic, length of time in treatment, and age. Primary care providers reported positive experiences overall.

Discussion: Three quarters of participating primary care clinics, adapting CoCM for limited resource settings, exceeded depression response outcomes reported in a controlled research trial and mirrored results of large-scale quality improvement implementations. Future research should examine quality improvement strategies to address clinic-level variation and sustain improvements in clinical outcomes achieved.

2.7. Carlo AD, Jeng PJ, Bao Y, Unützer J. The learning curve after implementation of collaborative care in a state mental health integration program. *Psychiatr Serv* 2019;70:139-142.

Summary: The authors found variation in depression outcomes in 8 clinics that implemented and provided collaborative care over 8 years. Improvements in process of care measures such as follow-up patient contacts generally preceded improvements in depression outcomes, across clinics.

Scientific Abstract:

Objective: This study examined organizational variability of process-of-care and depression outcomes at eight community health centers (CHCs) in the years following implementation of collaborative care (CC) for depression.

Methods: The authors used 8 years of observational data for 13,362 unique patients at eight CHCs that participated in Washington State's Mental Health Integration Program. Organization-level changes in depression and process-of-care outcomes over time were studied.

Results: On average, depression outcomes improved for the first 2 years before improvement slowed, peaking at year 5. Significant organization-level variation was noted in outcomes. Improvements in depression outcomes tended to follow process-of-care measures.

Conclusions: Findings suggest that it may take 2 years after implementation of CC to fully observe depression outcome improvement at an organization level. Substantial variation between organizations in depression outcomes over time suggests that sustained attention to processes of care may be necessary to maintain initially achieved gains.

2.8. Solberg LI, Glasgow RE, Unützer J, et al. Partnership research: a practical trial design for evaluation of a natural experiment to improve depression care. *Med Care*. 2010;48:576-582.

Summary: The authors described the process for implementing Collaborative Care in 85 primary care clinics including strategies for communication and timeline for implementation across clinics.

Scientific Abstract:

Background: Translational research is increasingly important as academic health centers transform themselves to meet new requirements of National Institutes of Health funding. Most attention has focused on T1 translation studies (bench to bedside) with considerable uncertainty about how to enhance T2 (effectiveness trials) and especially T3 (implementation studies).

Objective: To describe an innovative example of a T3 study, conducted as partnership research with the leaders of a major natural experiment in Minnesota to improve the primary care of depression.

Methods: All health plans in the state have agreed on a new payment model to support clinics that implement the well-evidenced collaborative care model for depression in the Depression Improvement Across Minnesota: Offering a New Direction initiative. The Depression Improvement Across Minnesota: Offering a New Direction study was developed in an ongoing partnership with the Initiative leaders from 7 health plans, 85 clinics, and a regional quality improvement collaborative to evaluate the implementation and its impacts on patients and other stakeholders. We agreed on a staggered implementation, multiple baseline research design, using the concepts of practical clinical trials and engaged scholarship and have collaborated on all aspects of conducting the study, including joint identification of patient and clinic survey recipients.

Results: Complex study methods have worked well through 20 months because of the commitment of all stakeholders to both the Initiative and the Study. Over 1500 subjects have been recruited from health plan information delivered weekly, and 99.7% of 316 physicians and administrators from all participating clinical organizations have completed the Study surveys.

2.9. Rossom R, Solberg LI, Magnan S, et al. Impact of a national collaborative care initiative for patients with depression and diabetes or cardiovascular disease. *Gen Hosp Psychiatry*. 2017;44:77-85.

Summary: A series of articles on the COMPASS initiative described methods and results of a 3 year Collaborative Care implementation effort in 172 primary care clinics for patients with depression and diabetes and/or cardiovascular disease. This article describes outcomes of the 3609 patients who received Collaborative Care treatment, which included approximately 40% of patients showing significant improvement in depression, and approximately one-quarter and over one-half meeting criteria for blood glucose and blood pressure control.

Scientific Abstract:

Objective: The spread of evidence-based care is an important challenge in healthcare. We evaluated spread of an evidence-based large-scale multisite collaborative care model for patients with depression and diabetes and/or cardiovascular disease (COMPASS).

Methods: Primary care patients with depression and comorbid diabetes or cardiovascular disease were recruited. Collaborative care teams used care management tracking systems and systematic case reviews to track and intensify treatment for patients not improving. Targeted outcomes were depression remission and response (assessed with the Patient Health Questionnaire-9) and control of diabetes (assessed by HbA1c) and blood pressure. Patients and clinicians were surveyed about satisfaction with care.

Results: Eighteen care systems and 172 clinics enrolled 3609 patients across the US. Of those with uncontrolled disease at enrollment, 40% achieved depression remission or response, 23% glucose control and 58% blood pressure control during a mean follow-up of 11 months. There were large variations in outcomes across medical groups. Patients and clinicians were satisfied with COMPASS care.

Conclusions: COMPASS was successfully spread across diverse care systems and demonstrated improved outcomes for complex patients with previously uncontrolled chronic disease. Future large-scale implementation projects should create robust processes to identify and reduce expected variation in implementation to consistently provide improved care.

3) Financing and Payment Model Evidence Base, Including Cost-Effectiveness

3.1. Jacob V, Chattopadhyay SK, Sipe TA, et al. Economics of Collaborative Care for management of depressive disorders: a community guide systematic review. *Am J Prev Med.* 2012;42:539-549.

Summary: A systematic review of 30 studies on economic outcomes, with most studies showing positive results regarding averted healthcare or productivity loss, and reduced healthcare utilization or enhanced productivity.

Scientific Abstract:

Context: Major depressive disorders are frequently underdiagnosed and undertreated. Collaborative Care models developed from the Chronic Care Model during the past 20 years have improved the quality of depression management in the community, raising intervention cost incrementally above usual care. This paper assesses the economic efficiency of collaborative care for management of depressive disorders by comparing its economic costs and economic benefits to usual care, as informed by a systematic review of the literature.

Evidence acquisition: The economic review of collaborative care for management of depressive disorders was conducted in tandem with a review of effectiveness, under the guidance of the Community Preventive Services Task Force, a nonfederal, independent group of public health leaders and experts. Economic review methods developed by the Guide to Community Preventive Services were used by two economists to screen, abstract, adjust, and summarize the economic evidence of collaborative care from societal and other perspectives. An earlier economic review that included eight RCTs was included as part of the evidence. The present economic review expanded the evidence with results from studies published from 1980 to 2009 and included both RCTs and other study designs.

Evidence synthesis: In addition to the eight RCTs included in the earlier review, 22 more studies of collaborative care that provided estimates for economic outcomes were identified, 20 of which were evaluations of actual

interventions and two of which were based on models. Of seven studies that measured only economic benefits of collaborative care in terms of averted healthcare or productivity loss, four found positive economic benefits due to intervention and three found minimal or no incremental benefit. Of five studies that measured both benefits and costs, three found lower collaborative care cost because of reduced healthcare utilization or enhanced productivity, and one found the same for a subpopulation of the intervention group. One study found that willingness to pay for collaborative care exceeded program costs. Among six cost-utility studies, five found collaborative care was cost effective. In two modeled studies, one showed cost effectiveness based on comparison of \$/disability-adjusted life-year to annual per capita income; the other demonstrated cost effectiveness based on the standard threshold of \$50,000/quality-adjusted life year, unadjusted for inflation. Finally, six of eight studies in the earlier review reported that interventions were cost effective on the basis of the standard threshold.

Conclusions: The evidence indicates that collaborative care for management of depressive disorders provides good economic value.

3.2. Lee CM, Scheuter C, Rochlin D, et al. A budget impact analysis of the Collaborative Care model for treating opioid use disorder in primary care. *J Gen Intern Med.* 2019;34:1693-1694.

Summary: The authors analyzed data from the SUMMIT clinical trial (4.5 Watkins, et al) and found the the costs of Collaborative Care are likely to be offset by savings if 25% of patients with opioid use disorder (one of the target conditions in the clinical trial) receive treatment in a panel size of about 85, while achieving better patient outcomes.

Scientific Abstract (adapted from text):

We performed a budget impact analysis on the expected increases in the expenditure of a health care system after the adoption CoCM to address OUD. We estimated 1-year costs and savings using published literature and structured interviews with content experts. Treatment effects were derived from an RCT. The simulation model estimated that the cost per patient treated with a panel size of 85 was \$2547 (SD \$190; 95% CI \$2173–\$2918). With a panel size of 85, the program would approximately breakeven but would have about a 14% chance of spending more than \$200 per patient, balanced by a 14% chance of gaining more than \$200 per patient. If the panel size is expanded to 120, cost per patient treated declines to \$2145 (SD \$141; 95% CI \$1867–\$2421), suggesting a likely positive balance. Our analysis suggests that the costs of a CoCM program are likely to be offset by savings if 25% of OUD patients receive treatment in a panel size of about 85, while achieving better patient outcomes.

3.3. Carlo AD, Corage Baden A, McCarty RL, et al. Early health system experiences with collaborative care (CoCM) billing codes: a qualitative study of leadership and support staff. *J Gen Intern Med* 2019; 34:2150–2158.

Summary: The authors interviewed clinicians and payers and found workflow changes necessary for Collaborative Care billing were significant barriers for which some clinics found creative solutions including blended Collaborative Care and fee for service billing.

Scientific Abstract:

Background: Although collaborative care (CoCM) is an evidence-based and widely adopted model, reimbursement challenges have limited implementation efforts nationwide. In recent years, Medicare and other payers have activated CoCM-specific codes with the primary aim of facilitating financial sustainability.

Objective: To investigate and describe the experiences of early adopters and explorers of Medicare's CoCM codes.

Design and participants: Fifteen interviews were conducted between October 2017 and May 2018 with 25 respondents representing 12 health care organizations and 2 payers. Respondents included dually boarded medicine/psychiatry physicians, psychiatrists, primary care physicians (PCPs), psychologists, a registered nurse, administrative staff, and billing staff.

Approach: A semi-structured interview guide was used to address health care organization characteristics, CoCM services, patient consent, CoCM operational components, and CoCM billing processes. All interviews were recorded, transcribed, coded, and analyzed using a content analysis approach conducted jointly by the research team.

Key results: Successful billing required buy-in from key, interdisciplinary stakeholders. In planning for CoCM billing implementation, several organizations hired licensed clinical social workers (LICSWs) as behavioral health care managers to maximize billing flexibility. Respondents reported a number of consent-related difficulties, but these were not primary barriers. Workflow changes required for billing the CoCM codes (e.g., tracking cumulative treatment minutes, once-monthly code entry) were described as arduous, but also stimulated creative solutions. Since CoCM codes incorporate the work of the psychiatric consultant into one payment to primary care, organizations employed strategies such as inter-departmental ledger transfers. When challenges arose from variations in the local payer mix, some organizations billed CoCM codes exclusively, while others elected to use a mixture of CoCM and traditional fee-for-service (FFS) codes. For most organizations, it was important to demonstrate financial sustainability from the CoCM codes.

Conclusions: With deliberate planning, persistence, and widespread organizational buy-in, successful utilization of newly available FFS CoCM billing codes is achievable.

3.4. Carlo AD, Drake L, Ratzliff ADH, et al. Sustaining the Collaborative Care Model (CoCM): Billing newly available CoCM CPT Codes in an academic primary care system. *Psychiatr Serv.* 2020;71:972-974.

Summary: This report describes the strategy one clinic system (14 clinics) used to effectively implement use of the Collaborative Care CPT codes to move the practice to financial sustainability.

Scientific Abstract:

Novel Current Procedural Terminology (CPT) codes specific to the collaborative care model (CoCM) offer advantages over traditional billing options, but their uptake may require considerable billing and clinical workflow adjustments. This column presents a case study addressing the challenges of using these codes within the University of Washington Neighborhood Clinics (UWNC), an academically affiliated primary care clinic system in western Washington State. The UWNC experience thus far demonstrates that CoCM CPT codes can successfully be used in a large academic primary care system to help move this evidence-based service model toward financial sustainability.

3.5. Unützer J, Chan YF, Hafer E, et al. Quality improvement with pay-for-performance incentives in integrated behavioral health care. *Am J Public Health.* 2012;102:e41-45.

Summary: The authors analyzed data from a Washington state-wide Collaborative Care program reaching 7941 patients with depressive symptoms from approximately 100 community health clinics. Quality of Collaborative Care was assessed by whether the care manager contacted the patient within 2 and 4 weeks after initial assessment, whether participants had psychiatric consultation case review, and

total number of care manager contacts, with 25% of clinic reimbursement being linked to benchmarks for these metrics. The authors analyzed data before and after pay-for-performance (P4P) was put into place, and found that after P4P was instituted, patients were considerably more likely to experience significant improvement in depression severity, and the time to improvement was significantly reduced, compared to before P4P. The median time patients experienced depression improvement decreased from 64 weeks pre-P4P to 25 weeks post P4P.

Scientific Abstract:

Objectives: We evaluated a quality improvement program with a pay-for-performance (P4P) incentive in a population-focused, integrated care program for safety-net patients in 29 community health clinics.

Methods: We used a quasi-experimental design with 1673 depressed adults before and 6304 adults after the implementation of the P4P program. Survival analyses examined the time to improvement in depression before and after implementation of the P4P program, with adjustments for patient characteristics and clustering by health care organization.

Results: Program participants had high levels of depression, other psychiatric and substance abuse problems, and social adversity. After implementation of the P4P incentive program, participants were more likely to experience timely follow-up, and the time to depression improvement was significantly reduced. The hazard ratio for achieving treatment response was 1.73 (95% confidence interval=1.39, 2.14) after the P4P program implementation compared with pre-program implementation.

Conclusions: Although this quasi-experiment cannot prove that the P4P initiative directly caused improved patient outcomes, our analyses strongly suggest that when key quality indicators are tracked and a substantial portion of payment is tied to such quality indicators, the effectiveness of care for safety-net populations can be substantially improved.

[3.6. Grochtdreis T, Brettschneider C, Wedener A, et al. Cost-effectiveness of collaborative care for the treatment of depressive disorders in primary care: a systematic review. PLOS One. 2015. Doi:10.1371.](#)

Summary: This *systematic review* addressed cost-effectiveness of Collaborative Care for individuals with depressive disorders in primary care. Nineteen studies were included in the review including 12 studies from the United States.

Interpreting results of cost-effectiveness analyses includes nuances of 1) considering the context of a clinical trial and usual absence of cost of conducting the trial in the analysis, 2) variable duration of cost-effectiveness (i.e. over 6 months, duration of trial, 1 year after the trial, etc.) and 3) variability in cost perspective, (person, health plan, society, etc). In this review, 5 studies used a societal view of costs, 11 studies used health care perspective, and 3 studies used both. Effectiveness was defined as depression free days in over half of studies, and as quality adjusted life years in all but one of the other studies. The authors discussed how studies with longer time horizons showed lower costs per effectiveness unit. Only two studies included indirect costs of patient productivity loss due to depression. Other cost-effectiveness studies (summarized in the systematic review) of Collaborative Care clinical trials have shown the cost of Collaborative Care varies widely from less than to more than usual care. In practice, start-up and implementation costs of Collaborative Care are not typically included in cost effectiveness

analyses and can limit clinics' adoption of Collaborative Care. Additional details of two cost-effectiveness analyses are below.

Scientific Abstract:

Background: For the treatment of depressive disorders, the framework of collaborative care has been recommended, which showed improved outcomes in the primary care sector. Yet, an earlier literature review did not find sufficient evidence to draw robust conclusions on the cost-effectiveness of collaborative care.

Purpose: To systematically review studies on the cost-effectiveness of collaborative care, compared with usual care for the treatment of patients with depressive disorders in primary care.

Methods: A systematic literature search in major databases was conducted. Risk of bias was assessed using the Cochrane Collaboration's tool. Methodological quality of the articles was assessed using the Consensus on Health Economic Criteria (CHEC) list. To ensure comparability across studies, cost data were inflated to the year 2012 using country-specific gross domestic product inflation rates, and were adjusted to international dollars using purchasing power parities (PPP).

Results: In total, 19 cost-effectiveness analyses were reviewed. The included studies had sample sizes between $n = 65$ to $n = 1,801$, and time horizons between six to 24 months. Between 42% and 89% of the CHEC quality criteria were fulfilled, and in only one study no risk of bias was identified. A societal perspective was used by five studies. Incremental costs per depression-free day ranged from dominance to US\$PPP 64.89, and incremental costs per QALY from dominance to US\$PPP 874,562.

Conclusion: Despite our review improved the comparability of study results, cost-effectiveness of collaborative care compared with usual care for the treatment of patients with depressive disorders in primary care is ambiguous depending on willingness to pay. A still considerable uncertainty, due to inconsistent methodological quality and results among included studies, suggests further cost-effectiveness analyses using QALYs as effect measures and a time horizon of at least 1 year.

3.7. Katon W, Russo J, Lin EHB, et al. Cost-effectiveness of a multicondition collaborative care intervention: a randomized controlled trial. Arch Gen Psychiatry. 2012;69:506-514.

Summary: This study analyzed data from a randomized controlled trial occurring in an integrated healthcare system comparing 12 months of care with multicondition collaborative care for individuals with depression and diabetes and/or cardiovascular disease, compared to usual care, in primary care. This cost effectiveness analysis included a total of a 24 month observation period. Individuals randomized to treatment with collaborative care were found to have 114 additional depression free days (effectiveness) and \$594 lower outpatient healthcare costs (cost).

Scientific Abstract:

Context: Patients with depression and poorly controlled diabetes mellitus, coronary heart disease (CHD), or both have higher medical complication rates and higher health care costs, suggesting that more effective care management of psychiatric and medical disease control might also reduce medical service use and enhance quality of life.

Objective: To evaluate the cost-effectiveness of a multicondition collaborative treatment program (TEAMcare) compared with usual primary care (UC) in outpatients with depression and poorly controlled diabetes or CHD. Design: Randomized controlled trial of a systematic care management program aimed at improving depression scores and hemoglobin A(1c) (HbA(1c)), systolic blood pressure (SBP), and low-density lipoprotein cholesterol (LDL-C) levels.

Setting: Fourteen primary care clinics of an integrated health care system.

Patients: Population-based screening identified 214 adults with depressive disorder and poorly controlled diabetes or CHD.

Intervention: Physician-supervised nurses collaborated with primary care physicians to provide treatment of multiple disease risk factors.

Main outcome measures: Blinded assessments evaluated depressive symptoms, SBP, and HbA(1c) at baseline and at 6, 12, 18, and 24 months. Fasting LDL-C concentration was assessed at baseline and at 12 and 24 months. Health plan accounting records were used to assess medical service costs. Quality-adjusted life-years (QALYs) were assessed using a previously developed regression model based on intervention vs UC differences in HbA(1c), LDL-C, and SBP levels over 24 months.

Results: Over 24 months, compared with UC controls, intervention patients had a mean of 114 (95% CI, 79 to 149) additional depression-free days and an estimated 0.335 (95% CI, -0.18 to 0.85) additional QALYs. Intervention patients also had lower mean outpatient health costs of \$594 per patient (95% CI, -\$3241 to \$2053) relative to UC patients.

Conclusions: For adults with depression and poorly controlled diabetes, CHD, or both, a systematic intervention program aimed at improving depression scores and HbA(1c), SBP, and LDL-C levels seemed to be a high-value program that for no or modest additional cost markedly improved QALYs.

3.8. Simon GE, Katon W, Lin EHB, et al. Cost-effectiveness of systematic depression treatment among people with diabetes mellitus. *Arch Gen Psychiatry*. 2007;64:65-72.

Summary: This study included an analysis of data from a randomized controlled trial occurring in an integrated healthcare system comparing 12 months of care with collaborative care for individuals with depression and diabetes, compared to usual care, in primary care. This analysis included a 24 month observation period. Individuals randomized to treatment with collaborative care were found to have 61 more depression free days (effectiveness) and about \$300 lower outpatient healthcare costs (cost).

Scientific Abstract:

Context: Depression co-occurring with diabetes mellitus is associated with higher health services costs, suggesting that more effective depression treatment might reduce use of other medical services.

Objective: To evaluate the incremental cost and cost-effectiveness of a systematic depression treatment program among outpatients with diabetes.

Design: Randomized controlled trial comparing systematic depression treatment program with care as usual.

Setting: Primary care clinics of group-model prepaid health plan.

Patients: A 2-stage screening process identified 329 adults with diabetes and current depressive disorder.

Intervention: Specialized nurses delivered a 12-month, stepped-care depression treatment program beginning with either problem-solving treatment psychotherapy or a structured antidepressant pharmacotherapy program. Subsequent treatment (combining psychotherapy and medication, adjustments to medication, and specialty referral) was adjusted according to clinical response.

Main outcome measures: Depressive symptoms were assessed by blinded telephone assessments at 3, 6, 12, and 24 months. Health service costs were assessed using health plan accounting records.

Results: Over 24 months, patients assigned to the intervention accumulated a mean of 61 additional days free of depression (95% confidence interval [CI], 11 to 82 days) and had outpatient health services costs that averaged \$314 less (95% CI, \$1007 less to \$379 more) compared with patients continuing in usual care. When an additional day free of depression is valued at \$10, the net economic benefit of the intervention is \$952 per patient treated (95% CI, \$244 to \$1660).

Conclusions: For adults with diabetes, systematic depression treatment significantly increases time free of depression and appears to have significant economic benefits from the health plan perspective. Depression screening and systematic depression treatment should become routine components of diabetes care.

4) Treating Racial/Ethnic Minority Groups with CoCM

4.1. Hu J, Wu T, Damodaran S, Tabb KM, Bauer A, Huang H. The effectiveness of collaborative care on depression outcomes for racial/ethnic minority populations in primary care: a systematic review. *Psychosomatics*. 2020, online first.

Summary: A recent systematic review addressed the question of effectiveness of Collaborative Care on depression outcomes for racial/ethnic minority populations in primary care.

The authors conducted a systematic review in 2020 and included articles comprising adult patients from at least one racial/ethnic minority group, located in the United States, measured depression outcomes quantitatively, and published in English. Included studies must have reported key components of Collaborative Care including patient-centered team care, population-based care, measurement-based treatment to target, and evidence-based care.

Nineteen studies (10 trials and 9 observational) were identified. Twelve studies compared Collaborative Care to usual depression care for minority patients, and 8 of those studies showed collaborative care was effective. Five studies compared depression outcomes in minority and white patients who received treatment with Collaborative Care, with results showing either equivalent or significantly better outcomes for minority compared to white individuals. Two trials tested the effectiveness of culturally-tailored Collaborative Care to usual Collaborative Care for minority individuals, and found equivalent or trend toward improvement outcomes. High-fidelity to Collaborative Care was discussed as the top priority for improving outcomes. Select studies included in the systematic review by 3.1.Hu, et al. are summarized below.

Scientific Abstract:

Background: Racial/ethnic minorities experience a greater burden of mental health problems than white adults in the United States. The collaborative care model is increasingly being adopted to improve access to services and to promote diagnosis and treatment of psychiatric diseases.

Objective: This systematic review seeks to summarize what is known about collaborative care on depression outcomes for racial/ethnic minorities in the United States.

Methods: This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses method. Collaborative care studies were included if they comprised adults from at least one racial/ethnic minority group, were located in primary care clinics in the United States, and had depression outcome measures. Core principles described by the University of Washington Advancing Integrated Mental Health Solutions Center were used to define the components of collaborative care.

Results: Of 398 titles screened, 169 full-length articles were assessed for eligibility, and 19 studies were included in our review (10 randomized controlled trials, 9 observational). Results show there is potential that collaborative care, with or without cultural/linguistic tailoring, is effective in improving depression for racial/ethnic minorities, including those from low socioeconomic backgrounds.

Conclusions: Collaborative care should be explored as an intervention for treating depression for racial/ethnic minority patients in primary care. Questions remain as to what elements of cultural adaptation are most helpful, factors behind the difficulty in recruiting minority patients for these studies, and how the inclusion of virtual components changes access to and delivery of care. Future research should also recruit individuals from less studied populations.

4.2. Arean P, Ayalon L, Hunkeler E. Improving depression care for older, minority patients in primary care. *Med Care.* 2005;43:381-390.

Summary: This report included a secondary analysis of data collected in a collaborative care treatment trial enrolling older adults in primary care (6.7. Unützer, et al.) to examine outcomes among individuals from three racial minority groups. Among 1801 individuals included in the clinical trial, 12% (n=222) were Black, 8% (n=138) were Latino, and 3% (n=53) were from other minority groups. In all ethnic and racial groups, treatment with Collaborative Care was associated with significantly improved 12 month outcomes due to more than doubling the effectiveness of depression treatment. Treatment effects were of similar magnitude in all racial and ethnic groups included in the trial.

Scientific Abstract:

Objective: Few older minorities receive adequate treatment of depression in primary care. This study examines whether a collaborative care model for depression in primary care is as effective in older minorities as it is in nonminority elderly patients in improving depression treatment and outcomes.

Study design: A multisite randomized clinical trial of 1801 older adults comparing collaborative care for depression with treatment as usual in primary care. Twelve percent of the sample were black (n = 222), 8% were Latino (n = 138), and 3% (n = 53) were from other minority groups. We compared the 3 largest ethnic groups (non-Latino white, black, and Latino) on depression severity, quality of life, and mental health service use at baseline, 3, 6, and 12 months after randomization to collaborative care or usual care.

Principal findings: Compared with care as usual, collaborative care significantly improved rates and outcomes of depression care in older adults from ethnic minority groups and in older whites. At 12 months, intervention patients from ethnic minorities (blacks and Latinos) had significantly greater rates of depression care for both antidepressant medication and psychotherapy, lower depression severity, and less health-related functional impairment than usual care participants (64%, 95% confidence interval [CI] 55-72 versus 45%, CI 36-55, P = 0.003 for antidepressant medication; 37%, CI 28-47 versus 13%, CI 6-19, P = 0.002 for psychotherapy; mean = 0.9, CI 0.8-1.1 versus mean = 1.4, CI 1.3-1.5, P < 0.001 for depression severity, range 0-4; mean = 3.7, CI 3.2-4.1, versus mean = 4.7, CI 4.3-5.1, P < 0.0001 for functional impairment, range 0-10).

Conclusions: Collaborative Care is significantly more effective than usual care for depressed older adults, regardless of their ethnicity. Intervention effects in ethnic minority participants were similar to those observed in whites.

4.3. 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;33:706-713.

Summary: This study recruited Hispanic adult primary care patients with diabetes and depression. Approximately 85% of participants were Spanish speaking. The study compared treatment with enhanced usual primary care to treatment with Collaborative Care that included social work diabetes depression clinical specialists as care managers working in safety net primary care clinics. The intervention sociocultural enhancements included psychoeducation to dispel treatment misconceptions and reduce stigma, patient choice of treatment, open-ended patient support group, 8-12 psychotherapy treatment sessions with tailored problem-solving treatment, and patient navigation. Patients receiving treatment with Collaborative Care were significantly more likely (1.5 times) to experience response or remission of depression symptoms compared to enhanced usual care.

Scientific Abstract:

Objective: To determine whether evidence-based socioculturally adapted collaborative depression care improves receipt of depression care and depression and diabetes outcomes in low-income Hispanic subjects.

Research design and methods: This was a randomized controlled trial of 387 diabetic patients (96.5% Hispanic) with clinically significant depression recruited from two public safety-net clinics from August 2005 to July 2007 and followed over 18 months. Intervention (INT group) included problem-solving therapy and/or antidepressant medication based on a stepped-care algorithm; first-line treatment choice; telephone treatment response, adherence, and relapse prevention follow-up over 12 months; plus systems navigation assistance. Enhanced usual care (EUC group) included standard clinic care plus patient receipt of depression educational pamphlets and a community resource list.

Results: INT patients had significantly greater depression improvement (> or =50% reduction in Symptom Checklist-20 depression score from baseline; 57, 62, and 62% vs. the EUC group's 36, 42, and 44% at 6, 12, and 18 months, respectively; odds ratio 2.46-2.57; $P < 0.001$). Mixed-effects linear regression models showed a significant study group-by-time interaction over 18 months in diabetes symptoms; anxiety; Medical Outcomes Study Short-Form Health Survey (SF-12) emotional, physical, and pain-related functioning; Sheehan disability; financial situation; and number of social stressors ($P = 0.04$ for disability and SF-12 physical functioning, $P < 0.001$ for all others) but no study group-by-time interaction in A1C, diabetes complications, self-care management, or BMI.

Conclusions: Socioculturally adapted collaborative depression care improved depression, functional outcomes, and receipt of depression treatment in predominantly Hispanic patients in safety-net clinics.

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

Summary: This report included a secondary analysis of data collected in a primary care Collaborative Care trial (6.9. Fortney, et al.) to explore outcomes among individuals from minority racial or ethnic groups, and the effect of minority status on treatment response ($n=360$). In this analysis, 25% ($n=88$) of the sample identified as a minority group. Patients in the usual care arm of the study showed no difference in response rates based on minority status. In the Collaborative Care arm, patients from minority groups had significantly higher response rates than Caucasian patients. Minority group status significantly moderated the treatment effect of Collaborative Care.

Scientific Abstract:

Objective: The authors examined racial differences in response rates to an intervention involving collaborative care and usual care among 360 veterans treated for depression at Department of Veterans Affairs community-based primary care clinics.

Methods: Individuals who screened positive for depression were assigned randomly to usual care ($N=200$) or to a collaborative care intervention ($N=160$) that provided phone contact when necessary with a registered nurse and clinical pharmacist to address issues related to compliance with medication and side effect management as well as supervision by a psychiatrist through video chats with the collaborative care team. Data about patients' characteristics, treatment history, and response to treatment were collected by telephone at baseline and after six months.

Results: Seventy-five percent ($N=272$) of the veterans were Caucasian, and 25% ($N=88$) belonged to a minority group, including 18% ($N=64$) who were African American, 3% ($N=11$) who were Native American, and 3.6% ($N=13$) who were of other minority groups. There were no significant differences between response rates between the Caucasian and minority group to usual care (18% and 8%, respectively), but the minority group had a higher response rate (42%) than Caucasians (19%) to the intervention ($\chi^2=8.2$, $df=1$, $p=.004$). Regression analysis indicated

that the interaction of minority group status by intervention significantly predicted response (odds ratio [OR]=6.2, 95% confidence interval [CI]=1.6-24.5, $p=.009$), even after adjustment for other factors associated with minority status (OR=6.0, 95% CI=1.5-24.3, $p=.01$).

Conclusions: Racial disparities in depression care may be ameliorated through collaborative care programs.

4.5. Cooper LA, 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;48:150-174.

Summary: Ten primary care clinics enrolled $n=132$ African American patients with depression who were randomized to depression treatment with standard collaborative care or patient-centered culturally-tailored collaborative care. Patients receiving treatment in both arms experienced similar depression outcomes at 6, 12 and 18 months. Some aspects of care, such as patient report of depression care manager identifying concerns and encouraging treatment adherence, were rated more favorably by patients in the patient-centered arm of the study.

Scientific Abstract:

Objective: To compare the effectiveness of standard and patient-centered, culturally tailored collaborative care (CC) interventions for African American patients with major depressive disorder (MDD) over 12 months of follow-up.

Data sources/study setting: Twenty-seven primary care clinicians and 132 African American patients with MDD in urban community-based practices in Maryland and Delaware.

Study design: Cluster randomized trial with patient-level, intent-to-treat analyses.

Data collection/extraction methods: Patients completed screener and baseline, 6-, 12-, and 18-month interviews to assess depression severity, mental health functioning, health service utilization, and patient ratings of care.

Principal findings: Patients in both interventions showed statistically significant improvements over 12 months. Compared with standard, patient-centered CC patients had similar reductions in depression symptom levels (-2.41 points; 95 percent confidence interval (CI), -7.7, 2.9), improvement in mental health functioning scores (+3.0 points; 95 percent CI, -2.2, 8.3), and odds of rating their clinician as participatory (OR, 1.48, 95 percent CI, 0.53, 4.17). Treatment rates increased among standard (OR = 1.8, 95 percent CI 1.0, 3.2), but not patient-centered (OR = 1.0, 95 percent CI 0.6, 1.8) CC patients. However, patient-centered CC patients rated their care manager as more helpful at identifying their concerns (OR, 3.00; 95 percent CI, 1.23, 7.30) and helping them adhere to treatment (OR, 2.60; 95 percent CI, 1.11, 6.08).

Conclusions: Patient-centered and standard CC approaches to depression care showed similar improvements in clinical outcomes for African Americans with depression; standard CC resulted in higher rates of treatment, and patient-centered CC resulted in better ratings of care.

4.6. Ratzliff ADH, Ni K, Chan YF, Park M, Unützer J. A collaborative care approach to depression treatment for Asian Americans. *Psychiatr Serv.* 2013;64:487-490.

Summary: The authors analyzed observational data to determine if Asian patients receiving collaborative care in one culturally sensitive Community Health Center primary care clinic that focuses on care of immigrant populations was associated with better engagement in treatment compared to Asian and white patients receiving care in other primary care clinics. The clinical program served a safety-net population with high proportion of individuals insured by Medicaid. Treatment outcomes

were explored. All three groups of patients (n=129 Asian patients at the culturally sensitive clinic, n=72 Asian patients treated in 12 other clinics, n=144 age- and gender-matched control patients) had similar depression outcomes. The culturally sensitive clinic engaged almost twice as many patients in depression treatment than the 12 other clinics combined, suggesting increased reach.

Scientific Abstract:

Objective: This study examined effectiveness of collaborative care for depression among Asians treated either at a community health center that focuses on Asians (culturally sensitive clinic) or at general community health centers and among a matched population of whites treated at the same general community clinics.

Methods: For 345 participants in a statewide collaborative care program, use of psychotropic medications, primary care visits with depression care managers, and depression severity (as measured with the nine-item Patient Health Questionnaire) were tracked at baseline and 16 weeks.

Results: After adjustment for differences in baseline demographic characteristics, all three groups had similar treatment process and depression outcomes. Asian patients served at the culturally sensitive clinic (N=129) were less likely than Asians (N=72) and whites (N=144) treated in general community health clinics to be prescribed psychotropic medications.

Conclusions: Collaborative care for depression showed similar response rates among all three groups.

4.7. Bowen D, Powers DM, Russo J, et al. Implementing collaborative care to reduce depression for rural native American/Alaska native people. BMC Health Services Research. 2020;20:34 doi.org/10.1186/s12913-019-4875-6

Summary: This study compared Collaborative Care treatment depression outcomes among Native American / Alaska Native (n=345) versus white (n=1473) and other (n=175) patients in three rural clinics implementing collaborative care. Collaborative Care treatment processes were similar in all groups. Treatment outcomes were similar in all groups, though Native American / Alaska Native group had slightly higher proportion of individuals with depression remission and significantly higher proportion of individuals with depression response, but had slightly lower severity of baseline depression.

Scientific Abstract:

Background: The purpose of this study was to identify the effects of Collaborative Care on rural Native American and Alaska Native (AI/AN) patients.

Methods: Collaborative Care was implemented in three AI/AN serving clinics. Clinic staff participated in training and coaching designed to facilitate practice change. We followed clinics for 2 years to observe improvements in depression treatment and to examine treatment outcomes for enrolled patients. Collaborative Care elements included universal screening for depression, evidence-based treatment to target, use of behavioral health care managers to deliver the intervention, use of psychiatric consultants to provide caseload consultation, and quality improvement tracking to improve and maintain outcomes. We used t-tests to evaluate the main effects of Collaborative Care and used multiple linear regression to better understand the predictors of success. We also collected qualitative data from members of the Collaborative Care clinical team about their experience.

Results: The clinics participated in training and practice coaching to implement Collaborative Care for depressed patients. Depression response (50% or greater reduction in depression symptoms as measured by the PHQ-9) and remission (PHQ-9 score less than 5) rates were equivalent in AI/AN patients as compared with White patients in the same clinics. Significant predictors of positive treatment outcome include only one depression treatment

episodes during the study and more follow-up visits per patient. Clinicians were overall positive about their experience and the effect on patient care in their clinic.

Conclusions: This project showed that it is possible to deliver Collaborative Care to AI/AN patients via primary care settings in rural areas.

5) Clinics Caring for Patients with in Under-Resourced Communities

5.1. 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;170:414-425.

Summary: This randomized trial compared remote and on-site Collaborative Care for rural Federally Qualified Health Centers (FQHCs). Five clinics participated and enrolled 364 patients with depression. Depression care managers were on-site at the clinics in one study arm, and off-site at an academic health center (co-located with the psychiatric consultant) in the other arm. On-site care managers could meet with patients face-to-face or by phone and documented in the clinic medical record; off-site care managers contacted patients by phone and faxed written notes to clinics. Remote care managers more often completed tasks associated with high fidelity Collaborative Care such as patient education, symptom monitoring, and working closely with the primary care clinicians, compared to on-site care managers. Patients treated in the off-site Collaborative Care arm were significantly (2-2.5 times) more likely to have depression response or remission at 6, 12, and 18 months, compared to the on-site arm.

Scientific Abstract:

Objective: Practice-based collaborative care is a complex evidence-based practice that is difficult to implement in smaller primary care practices that lack on-site mental health staff. Telemedicine-based collaborative care virtually co-locates and integrates mental health providers into primary care settings. The objective of this multisite randomized pragmatic comparative effectiveness trial was to compare the outcomes of patients assigned to practice-based and telemedicine-based collaborative care.

Method: From 2007 to 2009, patients at federally qualified health centers serving medically underserved populations were screened for depression, and 364 patients who screened positive were enrolled and followed for 18 months. Those assigned to practice-based collaborative care received evidence-based care from an on-site primary care provider and a nurse care manager. Those assigned to telemedicine-based collaborative care received evidence-based care from an on-site primary care provider and an off-site team: a nurse care manager and a pharmacist by telephone, and a psychologist and a psychiatrist via videoconferencing. The primary clinical outcome measures were treatment response, remission, and change in depression severity.

Results: Significant group main effects were observed for both response (odds ratio=7.74, 95% CI=3.94-15.20) and remission (odds ratio=12.69, 95% CI=4.81-33.46), and a significant overall group-by-time interaction effect was observed for depression severity on the Hopkins Symptom Checklist, with greater reductions in severity over time for patients in the telemedicine-based group. Improvements in outcomes appeared to be attributable to higher fidelity to the collaborative care evidence base in the telemedicine-based group.

Conclusions: Contracting with an off-site telemedicine-based collaborative care team can yield better outcomes than implementing practice-based collaborative care with locally available staff.

5.2. Katon W, Russo J, Reed S, et al. A randomized trial of collaborative depression care in obstetrics and gynecology clinics: socioeconomic disadvantage and treatment response. *Am J Psychiatry*. 2015;172:32-40.

Summary: The authors analyzed data from a Collaborative Care clinical trial showing that treatment with collaborative care improved depressive and functional outcomes in women seeking primary care in obstetrics and gynecology (Ob-Gyn) settings. The current study assessed effectiveness of Collaborative Care treating women with social disadvantages (n=120, 58.5%) defined as having no health insurance or Medicaid, Medicare, or Washington state insurance, compared to women with commercial insurance (n=85, 41.5%). In addition to usual Collaborative Care, the care managers (social workers) conducted an engagement session to promote participation in depression treatment, conducted proactive outreach, and helped identify options for charity care for medications. Patients with no or public insurance coverage (who were more likely than commercially insured patients to identify as minority status, older, had less social support and more likely to be living alone) showed significantly greater improvements with Collaborative Care at 12 and 18 months compared to patients with commercial insurance.

Scientific Abstract:

Objective: The authors evaluated whether an obstetrics-gynecology clinic-based collaborative depression care intervention is differentially effective compared with usual care for socially disadvantaged women with either no health insurance or with public coverage compared with those with commercial insurance.

Method: The study was a two-site randomized controlled trial with an 18-month follow-up. Women were recruited who screened positive (a score of at least 10 on the Patient Health Questionnaire-9) and met criteria for major depression or dysthymia. The authors tested whether insurance status had a differential effect on continuous depression outcomes between the intervention and usual care over 18 months. They also assessed differences between the intervention and usual care in quality of depression care and dichotomous clinical outcomes (a decrease of at least 50% in depressive symptom severity and patient-rated improvement on the Patient Global Improvement Scale).

Results: The treatment effect was significantly associated with insurance status. Compared with patients with commercial insurance, those with no insurance or with public coverage had greater recovery from depression symptoms with collaborative care than with usual care over the 18-month follow-up period. At the 12-month follow-up, the effect size for depression improvement compared with usual care among women with no insurance or with public coverage was 0.81 (95% CI=0.41, 0.95), whereas it was 0.39 (95% CI=-0.08, 0.84) for women with commercial insurance.

Conclusions: Collaborative depression care adapted to obstetrics-gynecology settings had a greater impact on depression outcomes for socially disadvantaged women with no insurance or with public coverage compared with women with commercial insurance.

5.3. Grote NK, Katon WJ, Russo JE, et al. Collaborative care for perinatal depression in socioeconomically disadvantaged women: a randomized trial. *Depress Anxiety*. 2015;32:821-834.

Summary: Participants (n=168) in this randomized clinical trial were pregnant women of diverse racial backgrounds insured by Medicaid. The trial compared effectiveness of two interventions, a culturally relevant Collaborative Care treatment (MOMCare) for depression, and intensive maternity support

services. Care managers in Collaborative Care were social workers, and did a variety of work including delivering an engagement session early on to address barriers to treatment, assessing patient preferences for treatment, conducting proactive outreach by phone and text, and case management to meet basic needs. The care managers could provide interpersonal therapy as treatment for depression. Both treatments were associated with improvements in depression, the MOMCare Collaborative Care intervention was significantly more effective on-average across 3-18 month time points.

Scientific Abstract:

Background: Both antenatal and postpartum depression have adverse, lasting effects on maternal and child well-being. Socioeconomically disadvantaged women are at increased risk for perinatal depression and have experienced difficulty accessing evidence-based depression care. The authors evaluated whether "MOMCare," a culturally relevant, collaborative care intervention, providing a choice of brief interpersonal psychotherapy and/or antidepressants, is associated with improved quality of care and depressive outcomes compared to intensive public health Maternity Support Services (MSS-Plus).

Methods: A randomized multisite controlled trial with blinded outcome assessment was conducted in the Seattle-King County Public Health System. From January 2010 to July 2012, pregnant women were recruited who met criteria for probable major depression and/or dysthymia, English-speaking, had telephone access, and ≥ 18 years old. The primary outcome was depression severity at 3-, 6-, 12-, 18-month postbaseline assessments; secondary outcomes included functional improvement, PTSD severity, depression response and remission, and quality of depression care.

Results: All participants were on Medicaid and 27 years old on average; 58% were non-White; 71% were unmarried; and 65% had probable PTSD. From before birth to 18 months postbaseline, MOMCare ($n = 83$) compared to MSS-Plus participants ($n = 85$) attained significantly lower levels of depression severity (Wald's $\chi(2) = 6.09$, $df = 1$, $P = .01$) and PTSD severity (Wald's $\chi(2) = 4.61$, $df = 1$, $P = .04$), higher rates of depression remission (Wald's $\chi(2) = 3.67$, $df = 1$, $P = .05$), and had a greater likelihood of receiving ≥ 4 mental health visits (Wald's $\chi(2) = 58.23$, $df = 1$, $P < .0001$) and of adhering to antidepressants in the prior month (Wald's $\chi(2) = 10.00$, $df = 1$, $P < .01$).

Conclusion: Compared to MSS-Plus, MOMCare showed significant improvement in quality of care, depression severity, and remission rates from before birth to 18 months postbaseline for socioeconomically disadvantaged women. Findings suggest that evidence-based perinatal depression care can be integrated into the services of a county public health system in the United States.

5.4. Lagomasino IT, Dwight-Johnson M, Green JM, et al. Effectiveness of collaborative care for depression in public-sector primary care clinics serving Latinos. *Psychiatr Serv.* 2017;68:353-359.

Summary: The authors evaluated Collaborative Care for depression in three public-sector primary care clinics in California serving predominantly low-income Latino individuals. At baseline, depressive symptom burden was high. The Collaborative Care intervention was associated with improvements in quality of depression care, partly due to care managers conducting significant outreach (average of 6 outreach phone calls per patient) to initiate depression treatment. Individuals receiving treatment with Collaborative Care experienced significantly better depression outcomes, with an over two-fold increase in the proportion of patients experiencing $>50\%$ reduction in depressive symptom severity.

Scientific Abstract:

Objective: Quality improvement interventions for depression care have been shown to be effective for improving quality of care and depression outcomes in settings with primarily insured patients. The aim of this study was to

determine the impact of a collaborative care intervention for depression that was tailored for low-income Latino patients seen in public-sector clinics.

Methods: A total of 400 depressed patients from three public-sector primary care clinics were enrolled in a randomized controlled trial of a tailored collaborative care intervention versus enhanced usual care. Social workers without previous mental health experience served as depression care specialists for the intervention patients (N=196). Depending on patient preference, they delivered a cognitive-behavioral therapy (CBT) intervention or facilitated antidepressant medication given by primary care providers or both. In enhanced usual care, patients (N=204) received a pamphlet about depression, a letter for their primary care provider stating that they had a positive depression screen, and a list of local mental health resources. Intent-to-treat analyses examined clinical and process-of-care outcomes at 16 weeks.

Results: Compared with patients in the enhanced usual care group, patients in the intervention group had significantly improved depression, quality of life, and satisfaction outcomes ($p < .001$ for all). Intervention patients also had significantly improved quality-of-care indicators, including the proportion of patients receiving either psychotherapy or antidepressant medication (77% versus 21%, $p < .001$).

Conclusions: Collaborative care for depression can greatly improve care and outcomes in public-sector clinics. Social workers without prior mental health experience can effectively provide CBT and manage depression care.

5.5. Watkins KE, Ober AJ, Lamp K, et al. Collaborative care for opioid and alcohol use disorders in primary care: The SUMMIT randomized clinical trial. *JAMA Intern Med.* 2017;177;1480-1488.

Summary: This study randomized 377 patients with alcohol use and/or opioid use disorders in 2 clinics of a Federally Qualified Health Center to treatment with Collaborative Care or to usual care for 6 months. Approximately one-third of participants reported Hispanic origin, and approximately half of participants reported current homelessness. Treatment with Collaborative Care resulted in a significantly greater proportion of individuals receiving higher quality of care and reporting abstinences from opioids or alcohol at 6 months.

Scientific Abstract:

Importance: Primary care offers an important and underutilized setting to deliver treatment for opioid and/or alcohol use disorders (OAUd). Collaborative care (CC) is effective but has not been tested for OAUd.

Objective: To determine whether CC for OAUd improves delivery of evidence-based treatments for OAUd and increases self-reported abstinence compared with usual primary care.

Design, setting, and participants: A randomized clinical trial of 377 primary care patients with OAUd was conducted in 2 clinics in a federally qualified health center. Participants were recruited from June 3, 2014, to January 15, 2016, and followed for 6 months.

Interventions: Of the 377 participants, 187 were randomized to CC and 190 were randomized to usual care; 77 (20.4%) of the participants were female, of whom 39 (20.9%) were randomized to CC and 38 (20.0%) were randomized to UC. The mean (SD) age of all respondents at baseline was 42 (12.0) years, 41(11.7) years for the CC group, and 43 (12.2) years for the UC group. Collaborative care was a system-level intervention, designed to increase the delivery of either a 6-session brief psychotherapy treatment and/or medication-assisted treatment with either sublingual buprenorphine/naloxone for opioid use disorders or long-acting injectable naltrexone for alcohol use disorders. Usual care participants were told that the clinic provided OAUd treatment and given a number for appointment scheduling and list of community referrals.

Main outcomes and measures: The primary outcomes were use of any evidence-based treatment for OAUd and self-reported abstinence from opioids or alcohol at 6 months. The secondary outcomes included the Healthcare

Effectiveness Data and Information Set (HEDIS) initiation and engagement measures, abstinence from other substances, heavy drinking, health-related quality of life, and consequences from OAUD.

Results: At 6 months, the proportion of participants who received any OAUD treatment was higher in the CC group compared with usual care (73 [39.0%] vs 32 [16.8%]; logistic model adjusted OR, 3.97; 95% CI, 2.32-6.79; $P < .001$). A higher proportion of CC participants reported abstinence from opioids or alcohol at 6 months (32.8% vs 22.3%); after linear probability model adjustment for covariates ($\beta = 0.12$; 95% CI, 0.01-0.23; $P = .03$). In secondary analyses, the proportion meeting the HEDIS initiation and engagement measures was also higher among CC participants (initiation, 31.6% vs 13.7%; adjusted OR, 3.54; 95% CI, 2.02-6.20; $P < .001$; engagement, 15.5% vs 4.2%; adjusted OR, 5.89; 95% CI, 2.43-14.32; $P < .001$) as was abstinence from opioids, cocaine, methamphetamines, marijuana, and any alcohol (26.3% vs 15.6%; effect estimate, $\beta = 0.13$; 95% CI, 0.03-0.23; $P = .01$).

Conclusions and relevance: Among adults with OAUD in primary care, the SUMMIT collaborative care intervention resulted in significantly more access to treatment and abstinence from alcohol and drugs at 6 months, than usual care.

5.6. Powers DM, Bowen DJ, Aaro RF, et al. Rural clinics implementing collaborative care for low-income patients can achieve comparable or better depression outcomes. *Fam Syst Health*. 2020;38:242-254.

Summary: Eight rural clinics implemented Collaborative Care and demonstrated that approximately 15% of the total clinic populations were treated with Collaborative Care, and that patients receiving Collaborative Care experienced clinically significant improvements in depression and reduction in suicidal ideation.

Scientific Abstract:

Introduction: The gap between depression treatment needs and the available mental health workforce is particularly large in rural areas. Collaborative care (CoCM) is an evidence-based approach that leverages limited mental health specialists for maximum population effect. This study evaluates depression treatment outcomes, clinical processes of care, and primary care provider experiences for CoCM implementation in 8 rural clinics treating low-income patients.

Method: We used CoCM registry data to analyze depression response and remission then used logistic regression to model variance in depression outcomes. Primary care providers reported their experiences with this practice change 18 months following program launch.

Results: Participating clinics enrolled 5,187 adult patients, approximately 15% of the adult patient population. Mean PHQ-9 depression score was 16.1 at baseline and 10.9 at last individual measurement, a statistically and clinically significant improvement (SD6.7; 95% CI [4.9, 5.3]). Suicidal ideation also reduced significantly. Multivariate logistic regression predicted the probability of depression response and remission after controlling for several demographic attributes and processes of care, showing a significant amount of variance in outcomes could be explained by clinic, length of time in treatment, and age. Primary care providers reported positive experiences overall.

Discussion: Three quarters of participating primary care clinics, adapting CoCM for limited resource settings, exceeded depression response outcomes reported in a controlled research trial and mirrored results of large-scale quality improvement implementations. Future research should examine quality improvement strategies to address clinic-level variation and sustain improvements in clinical outcomes achieved.

5.7. Unützer J, Chan YF, Hafer E, et al. Quality improvement with pay-for-performance incentives in integrated behavioral health care. *Am J Public Health*. 2012;102:e41-45.

Summary: The authors analyzed data from a Washington state-wide Collaborative Care program reaching 7941 patients with depressive symptoms from approximately 100 community health clinics. Quality of Collaborative Care was assessed by whether the care manager contacted the patient within 2 and 4 weeks after initial assessment, whether participants had psychiatric consultation case review, and total number of care manager contacts, with 25% of clinic reimbursement being linked to benchmarks for these metrics. The authors analyzed data before and after pay-for-performance (P4P) was put into place, and found that after P4P was instituted, patients were considerably more likely to experience significant improvement in depression severity, and the time to improvement was significantly reduced, compared to before P4P. The median time patients experienced depression improvement decreased from 64 weeks pre-P4P to 25 weeks post P4P.

Scientific Abstract:

Objectives: We evaluated a quality improvement program with a pay-for-performance (P4P) incentive in a population-focused, integrated care program for safety-net patients in 29 community health clinics.

Methods: We used a quasi-experimental design with 1673 depressed adults before and 6304 adults after the implementation of the P4P program. Survival analyses examined the time to improvement in depression before and after implementation of the P4P program, with adjustments for patient characteristics and clustering by health care organization.

Results: Program participants had high levels of depression, other psychiatric and substance abuse problems, and social adversity. After implementation of the P4P incentive program, participants were more likely to experience timely follow-up, and the time to depression improvement was significantly reduced. The hazard ratio for achieving treatment response was 1.73 (95% confidence interval=1.39, 2.14) after the P4P program implementation compared with pre-program implementation.

Conclusions: Although this quasi-experiment cannot prove that the P4P initiative directly caused improved patient outcomes, our analyses strongly suggest that when key quality indicators are tracked and a substantial portion of payment is tied to such quality indicators, the effectiveness of care for safety-net populations can be substantially improved.

6) Patients with Concurrent Physical and Psychiatric Conditions

6.1. Panagioti M, Bower P, Kontopantelis E, et al. Association between chronic physical conditions and the effectiveness of collaborative care for depression: an individual participant data meta-analysis. *JAMA Psychiatry*. 2016;73:978-989.

Summary: The authors reviewed 31 clinical trials and found that number of and type of chronic physical conditions did not influence treatment effect of collaborative care, showing evidence that collaborative care is effective for people with depression and chronic physical health conditions.

Scientific Abstract:

Importance: Collaborative care is an intensive care model involving several health care professionals working together, typically a physician, a case manager, and a mental health professional. Meta-analyses of aggregate data

have shown that collaborative care is particularly effective in people with depression and comorbid chronic physical conditions. However, only participant-level analyses can rigorously test whether the treatment effect is influenced by participant characteristics, such as chronic physical conditions.

Objective: To assess whether the effectiveness of collaborative care for depression is moderated by the presence, type, and number of chronic physical conditions.

Data sources: Data were obtained from MEDLINE, EMBASE, PubMed, PsycINFO, CINAHL Complete, and Cochrane Central Register of Controlled Trials, and references from relevant systematic reviews. The search and collection of eligible studies was ongoing until May 22, 2015.

Study selection: This was an update to a previous meta-analysis. Two independent reviewers were involved in the study selection process. Randomized clinical trials that compared the effectiveness of collaborative care with usual care in adults with depression and reported measured changes in depression severity symptoms at 4 to 6 months after randomization were included in the analysis. Key search terms included depression, dysthymia, anxiety, panic, phobia, obsession, compulsion, posttraumatic, care management, case management, collaborative care, enhanced care, and managed care.

Data extraction and synthesis: Individual participant data on baseline demographics and chronic physical conditions as well as baseline and follow-up depression severity symptoms were requested from authors of the eligible studies. One-step meta-analysis of individual participant data using appropriate mixed-effects models was performed.

Main outcomes and measures: Continuous outcomes of depression severity symptoms measured using self-reported or observer-rated measures.

Results: Data sets from 31 randomized clinical trials including 36 independent comparisons (N = 10 962 participants) were analyzed. Individual participant data analyses found no significant interaction effects, indicating that the presence (interaction coefficient, 0.02 [95% CI, -0.10 to 0.13]), numbers (interaction coefficient, 0.01 [95% CI, -0.01 to 0.02]), and types of chronic physical conditions do not influence the treatment effect.

Conclusions and relevance: There is evidence that collaborative care is effective for people with depression alone and also for people with depression and chronic physical conditions. Existing guidance that recommends limiting collaborative care to people with depression and physical comorbidities is not supported by this individual participant data meta-analysis.

6.2. Katon W, Lin EHB, Von Korff M, et al. Collaborative care for patients with depression and chronic illnesses. *N Engl J Med.* 2010;27:2611-2620.

Summary: The authors report primary results of a randomized trial comparing multi-condition Collaborative Care to usual care for patients with depression and diabetes and/or cardiovascular disease. Treatment with Collaborative Care was associated with significantly greater improvements in depression, and diabetes and cardiovascular disease measures, along with better quality of life and satisfaction with care.

Scientific Abstract:

Background: Patients with depression and poorly controlled diabetes, coronary heart disease, or both have an increased risk of adverse outcomes and high health care costs. We conducted a study to determine whether coordinated care management of multiple conditions improves disease control in these patients.

Methods: We conducted a single-blind, randomized, controlled trial in 14 primary care clinics in an integrated health care system in Washington State, involving 214 participants with poorly controlled diabetes, coronary heart disease, or both and coexisting depression. Patients were randomly assigned to the usual-care group or to the intervention group, in which a medically supervised nurse, working with each patient's primary care physician, provided guideline-based, collaborative care management, with the goal of controlling risk factors associated with

multiple diseases. The primary outcome was based on simultaneous modeling of glycosylated hemoglobin, low-density lipoprotein (LDL) cholesterol, and systolic blood-pressure levels and Symptom Checklist-20 (SCL-20) depression outcomes at 12 months; this modeling allowed estimation of a single overall treatment effect.

Results: As compared with controls, patients in the intervention group had greater overall 12-month improvement across glycosylated hemoglobin levels (difference, 0.58%), LDL cholesterol levels (difference, 6.9 mg per deciliter [0.2 mmol per liter]), systolic blood pressure (difference, 5.1 mm Hg), and SCL-20 depression scores (difference, 0.40 points) ($P<0.001$). Patients in the intervention group also were more likely to have one or more adjustments of insulin ($P=0.006$), antihypertensive medications ($P<0.001$), and antidepressant medications ($P<0.001$), and they had better quality of life ($P<0.001$) and greater satisfaction with care for diabetes, coronary heart disease, or both ($P<0.001$) and with care for depression ($P<0.001$).

Conclusions: As compared with usual care, an intervention involving nurses who provided guideline-based, patient-centered management of depression and chronic disease significantly improved control of medical disease and depression.

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

Summary: Results of a clinical trial of patients with concurrent depression and cancer showed that treatment with Collaborative Care was associated with significantly better depression outcomes, and that over 60% of people improved in the Collaborative Care arm, compared to 17% in usual care. Patients in Collaborative Care also reported less fatigue, pain, anxiety, and better quality of life.

Scientific Abstract:

Background: Medical conditions are often complicated by major depression, with consequent additional impairment of quality of life. We aimed to compare the effectiveness of an integrated treatment programme for major depression in patients with cancer (depression care for people with cancer) with usual care.

Methods: SMaRT Oncology-2 is a parallel-group, multicentre, randomised controlled effectiveness trial. We enrolled outpatients with major depression from three cancer centres and their associated clinics in Scotland, UK. Participants were randomly assigned in a 1:1 ratio to the depression care for people with cancer intervention or usual care, with stratification (by trial centre) and minimisation (by age, primary cancer, and sex) with allocation concealment. Depression care for people with cancer is a manualised, multicomponent collaborative care treatment that is delivered systematically by a team of cancer nurses and psychiatrists in collaboration with primary care physicians. Usual care is provided by primary care physicians. Outcome data were collected up until 48 weeks. The primary outcome was treatment response ($\geq 50\%$ reduction in Symptom Checklist Depression Scale [SCL-20] score, range 0-4) at 24 weeks. Trial statisticians and data collection staff were masked to treatment allocation, but participants could not be masked to the allocations. Analyses were by intention to treat. This trial is registered with Current Controlled Trials, number ISRCTN40568538.

Findings: 500 participants were enrolled between May 12, 2008, and May 13, 2011; 253 were randomly allocated to depression care for people with cancer and 247 to usual care. 143 (62%) of 231 participants in the depression care for people with cancer group and 40 (17%) of 231 in the usual care group responded to treatment: absolute difference 45% (95% CI 37-53), adjusted odds ratio 8.5 (95% CI 5.5-13.4), $p<0.0001$. Compared with patients in the usual care group, participants allocated to the depression care for people with cancer programme also had less depression, anxiety, pain, and fatigue; and better functioning, health, quality of life, and perceived quality of depression care at all timepoints (all $p<0.05$). During the study, 34 cancer-related deaths occurred (19 in the depression care for people with cancer group, 15 in the usual care group), one patient in the depression care for

people with cancer group was admitted to a psychiatric ward, and one patient in this group attempted suicide. None of these events were judged to be related to the trial treatments or procedures.

Interpretation: Our findings suggest that depression care for people with cancer is an effective treatment for major depression in patients with cancer. It offers a model for the treatment of depression comorbid with other medical conditions.

6.4. Ma J, Goldman Rosas L, Lv N, et al. Effect of integrated behavioral weight loss treatment and problem-solving therapy on body mass index and depressive symptoms among patients with obesity and depression: the RAINBOW randomized clinical trial. *JAMA*. 2019;321:869-879.

Summary: The authors combined evidenced based programs of depression treatment and weight-loss treatment and delivered the intervention with Collaborative Care in primary care for adult patients with depression and obesity. Findings included significant reduction in Body Mass Index (BMI) and depression symptoms in those receiving Collaborative Care, compared to no change in either BMI or depression symptoms over 12 months for those receiving usual care.

Scientific Abstract:

Importance: Coexisting obesity and depression exacerbate morbidity and disability, but effective treatments remain elusive.

Objective: To test the hypothesis that an integrated collaborative care intervention would significantly improve both obesity and depression at 12 months compared with usual care.

Design, setting, and participants: The Research Aimed at Improving Both Mood and Weight (RAINBOW) randomized clinical trial enrolled 409 adults with body mass indices (BMIs) of 30 or greater (≥ 27 for Asian adults) and 9-item Patient Health Questionnaire (PHQ-9) scores of 10 or greater. Primary care patients at a health system in Northern California were recruited from September 30, 2014, to January 12, 2017; the date of final 12-month follow-up was January 17, 2018.

Interventions: All participants randomly assigned to the intervention (n = 204) or the usual care control group (n = 205) received medical care from their personal physicians as usual, received information on routine services for obesity and depression at their clinic, and received wireless physical activity trackers. Intervention participants also received a 12-month intervention that integrated a Diabetes Prevention Program-based behavioral weight loss treatment with problem-solving therapy for depression and, if indicated, antidepressant medications.

Main outcomes and measures: The co-primary outcome measures were BMI and 20-item Depression Symptom Checklist (SCL-20) scores (range, 0 [best] to 4 [worst]) at 12 months.

Results: Among 409 participants randomized (mean age of 51.0 years [SD, 12.1 years]; 70% were women; mean BMI of 36.7 [SD, 6.4]; mean PHQ-9 score of 13.8 [SD, 3.1]; and mean SCL-20 score of 1.5 [SD, 0.5]), 344 (84.1%) completed 12-month follow-up. At 12 months, mean BMI declined from 36.7 (SD, 6.9) to 35.9 (SD, 7.1) among intervention participants compared with a change in mean BMI from 36.6 (SD, 5.8) to 36.6 (SD, 6.0) among usual care participants (between-group mean difference, -0.7 [95% CI, -1.1 to -0.2]; P = .01). Mean SCL-20 score declined from 1.5 (SD, 0.5) to 1.1 (SD, 1.0) at 12 months among intervention participants compared with a change in mean SCL-20 score from 1.5 (SD, 0.6) to 1.4 (SD, 1.3) among usual care participants (between-group mean difference, -0.2 [95% CI, -0.4 to 0]; P = .01). There were 47 adverse events or serious adverse events that involved musculoskeletal injuries (27 in the intervention group and 20 in the usual care group).

Conclusions and relevance: Among adults with obesity and depression, a collaborative care intervention integrating behavioral weight loss treatment, problem-solving therapy, and as-needed antidepressant medications significantly improved weight loss and depressive symptoms at 12 months compared with usual care; however, the effect sizes were modest and of uncertain clinical importance.

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

Summary: In 3 VA clinics, 249 patients enrolled and were randomized to collaborative care or usual care for depression. The RN depression care manager and supervising psychiatrist were off-site from the participating clinics but were co-located at a VA Medical Center. Treatment with Collaborative Care doubled the proportion of patients with depression response and remission at 6 months.

Scientific Abstract:

Background: Depression is common among persons with the human immunodeficiency virus (HIV) and is associated with unfavorable outcomes.

Methods: A single-blind randomized controlled effectiveness trial at 3 Veterans Affairs HIV clinics (HIV Translating Initiatives for Depression Into Effective Solutions [HITIDES]). The HITIDES intervention consisted of an off-site HIV depression care team (a registered nurse depression care manager, pharmacist, and psychiatrist) that delivered up to 12 months of collaborative care backed by a Web-based decision support system. Participants who completed the baseline telephone interview were 249 HIV-infected patients with depression, of whom 123 were randomized to the intervention and 126 to usual care. Participant interview data were collected at baseline and at the 6- and 12-month follow-up visits. The primary outcome was depression severity measured using the 20-item Hopkins Symptom Checklist (SCL-20) and reported as treatment response ($\geq 50\%$ decrease in SCL-20 item score), remission (mean SCL-20 item score, < 0.5), and depression-free days. Secondary outcomes were health-related quality of life, health status, HIV symptom severity, and antidepressant or HIV medication regimen adherence.

Results: Intervention participants were more likely to report treatment response (33.3% vs 17.5%) (odds ratio, 2.50; 95% confidence interval [CI], 1.37-4.56) and remission (22.0% vs 11.9%) (2.25; 1.11-4.54) at 6 months but not 12 months. Intervention participants reported more depression-free days during the 12 months ($\beta = 19.3$; 95% CI, 10.9-27.6; $P < .001$). Significant intervention effects were observed for lowering HIV symptom severity at 6 months ($\beta = -2.6$; 95% CI, -3.5 to -1.8; $P < .001$) and 12 months ($\beta = -0.82$; -1.6 to -0.07; $P = .03$). Intervention effects were not significant for other secondary outcomes.

Conclusion: The HITIDES intervention improved depression and HIV symptom outcomes and may serve as a model for collaborative care interventions in HIV and other specialty physical health care settings where patients find their "medical home."