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Review Article

# 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

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**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.*

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The Academy of Psychosomatic Medicine (APM) has a set of strategic goals. These include positioning the organization in a leadership position in aspects of health care reform for which members provide unique expertise, knowledge, and experience. APM members have already played leadership roles in the development of collaborative care (CC) models for depression and other psychiatric disorders in the medically ill. Considerable research demonstrates the effectiveness of these models in meeting the "triple

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aim" goals of health reform: improving the patient experience of care, improving the health of populations, and lowering health care costs.

CC interventions typically combine 3 core components. First, they utilize systematic psychiatric assessment. For example, in CC programs for depression, the use of a validated and structured depression assessment tool, such as the Patient Health Questionnaire-9 (PHQ-9), as part of routine clinical visits is a common assessment strategy. Second, these models use a nonphysician care manager to perform longitudinal symptom monitoring, treatment interventions, and care coordination. Most commonly, this is a nurse who is located within the medical setting and can perform further evaluation of positive-screen patients. If a patient meets criteria for entry into a CC program, the care manager can continue assessment over time (e.g., via the PHQ-9); coordinate pharmacotherapy recommendations to primary medical providers; and provide support, education, and evidence-based psychotherapy (e.g., problem-solving therapy) to patients as appropriate. Finally, CC programs include specialist-provided stepped-care recommendations, usually from a CC team psychiatrist who reviews the case with the care manager and provides specific recommendations prompted by results of the serial assessments; a key concept is the idea of using multiple steps of treatment (e.g., several medication adjustments) as needed to get the patient's mental health disorder fully into remission.

As CC clinical programs and research efforts expand, the amount of relevant scientific literature has increased almost exponentially. The Academy's Research and Evidence-Based Practice Committee has coordinated reviews of CC articles to identify essential scientific publications for those interested in learning more about this care model. The purpose of this article was to create an annotated list of seminal publications in the field, including original research trials, studies of clinical implementation, assessments of cost-effectiveness, and pertinent reviews of the literature. Articles were identified using a systematic search of electronic databases and reviews, and selection was based on quality and importance. Each key article was then annotated to summarize its essential features and findings.

## METHODS

A PubMed/MEDLINE review of literature (January 1970–May 2013) was conducted to identify articles in the scientific literature related to CC models and outcomes. Identification of search terms emphasized studies containing clinical data empirically demonstrated to be of relevance to clinical outcome or cost-effectiveness of CC. Search terms included CC, integrated care, treatment-resistant depression, depressive disorder, anxiety, antidepressant treatment, medical-psychiatric co-morbidity, and cost-effectiveness. Identified articles were hand searched for additional references. Finally, 3 other content-matter experts, also APM members (J.R., M.S., and W.K.) reviewed the selected articles and made recommendations regarding additional articles for consideration. Over 600 articles were identified.

Three reviewers (S.N., J.R., J.H.) independently categorized the articles according to specific rating criteria (e.g., based on sample size, study design, inclusion/exclusion criteria) and to specific categories of content (e.g., the specific population studied, such as patients with diabetes). Meta-analyses and high-quality randomized controlled trials [RCTs] were rated most highly on quality of data categorization. Papers were further assigned to the following content categories: (A) seminal randomized trials in CC; (B) CC intervention trials in specific medical conditions; (C) CC intervention trials in special populations (e.g., in African Americans and in patients with bipolar disorder); (D) clinical implementation analyses; (E) cost-effectiveness studies; and (F) reviews, commentaries, and meta-analyses. The raters agreed 96% of the time on category assignment and priority. Finally, the 3 senior content-matter experts validated the final assignment of the 67 included articles. The authors also identified 5 websites that were felt to provide high-quality information about CC programs.

## Seminal Studies of Collaborative Care for Depression in General Medical Populations

*Unützer J, Katon W, Callahan CM, Williams JW Jr, Hunkeler E, Harpole L, Hoffing M, Della Penna RD, Noël PH, Lin EH, Areán PA, Hegel MT, Tang L, Belin TR, Oishi S, Langston C. Collaborative care management of late-life depression in the primary care setting: a randomized controlled trial. JAMA 2002;288(22):2836-2845.* http://www.ncbi.nlm.nih.gov/pubmed/12472325.

An early, large trial (the IMPACT study) of CC compared with usual care in older adults with depression assessed and enrolled in managed care primary care settings spanning 8 health care organizations in 5 states. Intervention patients had a depression care manager, supervised by a psychiatrist and a primary care expert, who offered education, care management, and support of antidepressant management by the patient's primary care physician or a brief psychotherapy for depression. Overall, 1800 patients were randomized to receive CC depression care management or treatment as usual. Collaborative care was associated with significantly greater improvements in depression, function, and quality of life at 12 months.

*Bruce ML, Ten Have TR, Reynolds CF 3rd, Katz II, Schulberg HC, Mulsant BH, Brown GK, McAvay GJ, Pearson JL, Alexopoulos GS. Reducing suicidal ideation and depressive symptoms in depressed older primary care patients: a randomized controlled trial. JAMA 2004;291(9):1081-1091.* http://www.ncbi.nlm.nih.gov/pubmed/14996777.

A key early CC RCT in depressed older adults seen in varied fee-for-service primary care settings. Practice-based, depression care managers collaborated with physicians by helping them recognize depression, offering guideline-based treatment recommendations, monitoring clinical status, providing appropriate follow-up, and delivering interpersonal therapy as indicated. A total of 598 depressed adults were randomized, and CC was associated with reduced depression and suicidal ideation compared with usual care.

*Katon WJ, Lin EH, Von Korff M, Ciechanowski P, Ludman EJ, Young B, Peterson D, Rutter CM, McGregor M, McCulloch D. Collaborative care for patients with depression and chronic illnesses. N Engl J Med 2010;363(27):2611-2620.* http://www.ncbi.nlm.nih.gov/pubmed/21190455.

Results of the TEAMCare trial ($N = 214$), an RCT of a blended care management intervention that intervened upon depression and medical targets (e.g., blood pressure or blood glucose) in depressed primary care patients in a managed/integrated care setting (group health, a mixed-model prepaid health plan) with either diabetes or heart failure. Patients who received CC received interventions and management of both depression (via pharmacotherapy or care manager–delivered psychotherapy) and chronic medical illness (via assessment of illness markers and coordination of treatment adjustments to targeted outcomes). Intervention patients had lower cholesterol levels, blood pressure, and hemoglobin A1c levels at 12 months, in addition to better quality of life and less depression, compared with those getting usual care. This was the first trial of this combined approach and it achieved across-the-board medical improvements in diabetes/coronary heart disease control, mental health, and quality-of-life outcomes.

*Hunkeler EM, Katon W, Tang L, Williams JW Jr, Kroenke K, Lin EH, Harpole LH, Arean P, Levine S, Grypma LM, Hargreaves WA, Unützer J. Long term outcomes from the IMPACT randomised trial for depressed elderly patients in primary care. BMJ 2006;332(7536):259-263.* http://www.ncbi.nlm.nih.gov/pubmed/16428253.

This article assessed ongoing effects on outcomes after the 12-month IMPACT intervention described earlier. Intervention patients continued to fare significantly better than controls regarding remission of depression, physical functioning, and quality of life at 18/24 months.

*Gallo JJ, Morales KH, Bogner HR, Raue PJ, Zee J, Bruce ML, Reynolds CF 3rd. Long term effect of depression care management on mortality in older adults: follow-up of cluster randomized clinical trial in primary care. BMJ 2013;346:f2570.* http://www.ncbi.nlm.nih.gov/pubmed/23738992.

This was a long-term analysis of outcomes from the PROSPECT trial, a 2-year depression CC intervention in older adults, described previously. Participants ($N = 1226$) included patients identified as having either major depression or clinically significant minor depression (who received either intervention or usual care) and a subset of patients without depression. The goal of this follow-up analysis was to compare mortality risk among the participant groups. Over a median 98 months of follow-up, the patients with major depression in usual care were more likely to die than were those without depression (hazard ratio 1.90, 95% confidence interval 1.57–2.31). In contrast, patients with major depression in intervention practices were at no greater risk than were people without depression (hazard ratio 1.09, 0.83–1.44). Patients with major depression in intervention practices, relative to usual care, were 24% less likely to have died. No significant effect on mortality was found for minor depression.

## Major Reviews and Editorials

*Archer J, Bower P, Gilbody S, Lovell K, Richards D, Gask L, Dickens C, Coventry P. Collaborative care for depression and anxiety problems. Cochrane Database Syst Rev 2012;10:CD006525.* http://www.ncbi.nlm.nih.gov/pubmed/23076925.

This was a Cochrane review of CC interventions for depression or anxiety. This review examined 79 RCTs involving over 24,000 patients. The authors found that CC had significantly greater effects on depression and anxiety (standardized mean difference of approximately 0.3 for nearly all analyses) in the short-, medium-, and long-term compared with control conditions. Such interventions also appeared to provide benefit on mental quality of life, medication use/adherence, and overall satisfaction with care; there was less evidence for effect on physical health–related quality of life.

*Katon W, Unutzer J. Health reform and the Affordable Care Act: The importance of mental health treatment to achieving the triple aim. J Psychosom Res 2013; 74(6):533-537.* http://www.ncbi.nlm.nih.gov/pubmed/23731753.

An editorial describing the vital need for improved quality of mental health care in general medical settings to meet the 'triple aim' of improving access to and satisfaction with care, improving quality and outcomes of care, and reducing total health care costs. The article reviews CC interventions in this context and their promise in helping health care systems to reach this complex triple aim.

*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):456-464.* http://www.ncbi.nlm.nih.gov/pubmed/20851265.

A review of the evolution of collaborative depression care from 4 seminal figures in the development of this intervention. The article describes the history and progression of collaborative depression care, adaptation of CC to new populations and medical settings, and optimal ways to enhance dissemination of this model.

*Thota AB, Sipe TA, Byard GJ, Zometa CS, Hahn RA, McKnight-Eily LR, Chapman DP, Abraido-Lanza AF, Pearson JL, Anderson CW, Gelenberg AJ, Hennessy KD, Duffy FF, Vernon-Smiley ME, Nease DE Jr, Williams SP; Community Preventive Services Task Force. Collaborative care to improve the management of depressive disorders: a community guide systematic review and meta-analysis. Am J Prev Med 2012;42(5):525-538.* http://www.ncbi.nlm.nih.gov/pubmed/22516495.

A review and meta-analysis of the effectiveness of CC for depression, updating a prior key meta-analysis (Gilbody et al.) and utilizing data from 69 trials. Results suggest robust evidence of effectiveness of CC (compared with usual care) in improving depression symptoms (effect size = 0.34) and adherence to treatment (odds ratio [OR] = 2.22); response to treatment (OR = 1.78) and remission of symptoms (OR = 1.74); recovery from symptoms (OR = 1.75), quality of life/functional status (effect size = 0.12), and satisfaction with care (effect size = 0.39).

*Fann JR, Ell K, Sharpe M. Integrating psychosocial care into cancer services. J Clin Oncol 2012;30(11):1178-1186.* http://www.ncbi.nlm.nih.gov/pubmed/22412139.

A review of integrated-care paradigms, primarily CC models, that could be used to address the psychosocial and psychiatric conditions that require evidence-based treatment for patients with cancer. The authors conclude by proposing the key components of an integrated psychosocial service that could be implemented immediately and by considering future steps.

*Druss BG, Mauer BJ. Health care reform and care at the behavioral health—primary care interface. Psychiatr Serv 2010;61(11):1087-1092.* http://www.ncbi.nlm.nih.gov/pubmed/21041346

A review by top public health experts regarding 2 specific integrated-care initiatives: the Medicaid and Medicare patient-centered medical home demonstration projects and expansion of a Substance Abuse and Mental Health Services Administration program that colocates primary care services in community mental health settings. The authors provide an overview of key supporting factors vital for ensuring that initiatives are successful in improving care.

*van der Feltz-Cornelis CM, Van Os TW, Van Marwijk HW, Leentjens AF. Effect of psychiatric consultation models in primary care. A systematic review and meta-analysis of randomized clinical trials. J Psychosom Res 2010;68(6):521-533.* http://www.ncbi.nlm.nih.gov/pubmed/20488268.

A review of 10 RCTs examining the effect of psychiatric outpatient consultation models in primary

care for depression and somatoform disorders. Effect of consultation was greater for somatoform disorders, especially when a specific consultation letter was crafted by the consultant (effect size on illness burden = 0.56), and the effect of consultation for all patients was greatest on health care utilization (effect size = 0.51).

*Katon W. Collaborative depression care models: from development to dissemination. Am J Prev Med 2012; 42(5):550-552.* http://www.ncbi.nlm.nih.gov/pubmed/22516497.

An editorial on a meta-analysis of CC interventions and a cost-effectiveness review from the same issue of *Am J Prev Med,* placed in context by Wayne Katon.

*Cape J, Whittington C, Bower P. What is the role of consultation-liaison psychiatry in the management of depression in primary care? A systematic review and meta-analysis. Gen Hosp Psychiatry 2010;32(3):246-254.* http://www.ncbi.nlm.nih.gov/pubmed/20430227.

A review and meta-analysis of evidence concerning consultation liaison for depression in primary care. It concludes that the evidence remains limited, but that studies published up to 2010 do not indicate that this model is likely to be more effective than usual care.

## Studies of Integrated Care for Depression in Specific Medical Conditions

### *Cardiac/Diabetes*

*Rollman BL, Belnap BH, LeMenager MS, Mazumdar S, Houck PR, Counihan PJ, Kapoor WN, Schulberg HC, Reynolds CF 3rd. Telephone-delivered collaborative care for treating post-CABG depression: a randomized controlled trial. JAMA 2009;302(19):2095-2103.* http://www.ncbi.nlm.nih.gov/pubmed/19918088.

An RCT comparing phone-delivered CC with usual care in 302 patients with depression who had received coronary artery bypass graft surgery in academic and community hospitals. Patients receiving CC were assigned a depression care manager who provided longitudinal assessment, facilitated stepped pharmacotherapy, and provided phone-based psychotherapy. CC produced greater improvements in depression, function, and (primary outcome) mental health-related quality of life (HRQoL) but had no significant effect on cardiac outcomes (e.g., readmissions).

*Davidson KW, Bigger JT, Burg MM, Carney RM, Chaplin WF, Czajkowski S, Dornelas E, Duer-Hefele J, Frasure-Smith N, Freedland KE, Haas DC, Jaffe AS, Ladapo JA, Lespérance F, Medina V, Newman JD, Osorio GA, Parsons F, Schwartz JE, Shaffer JA, Shapiro PA, Sheps DS, Vaccarino V, Whang W, Ye S. Centralized, stepped, patient preference-based treatment for patients with post-acute coronary syndrome depression: CODIACS Vanguard randomized controlled trial. JAMA Intern Med 2013; 173(11):997-1004.* http://www.ncbi.nlm.nih.gov/pubmed/23471421.

An RCT of an integrated-care model for depression in 150 patients with a recent acute coronary syndrome cared for in private or academic ambulatory centers. Patients randomized to the intervention received psychotherapy from a centralized location or medication from a study prescriber (as opposed to prescription from patients' clinical care provider, the more standard approach in CC) or both, provided in a stepped-care manner. Compared with usual care subjects, intervention subjects had substantially greater reduction in depression at the primary (6-month) timepoint; the intervention appeared to be cost neutral.

*Katon W, Lin EH, Von Korff M, Ciechanowski P, Ludman E, Young B, Rutter C, Oliver M, McGregor M. Integrating depression and chronic disease care among patients with diabetes and/or coronary heart disease: the design of the TEAMcare study. Contemp Clin Trials 2010;31(4):312-322.* http://www.ncbi.nlm.nih.gov/pubmed/20350619.

Description of the methods of the "blended" CC intervention TEAMcare trial described earlier. This intervention-integrated depression care management and diabetes/heart failure care using treat-to-target interventions for depression, blood pressure, cholesterol, and glycemic control via medications, therapeutic interventions, and motivational interviewing in a cohort of patients with depression plus diabetes or heart failure.

*Bogner HR, Morales KH, de Vries HF, Cappola AR. Integrated management of type 2 diabetes mellitus and depression treatment to improve medication adherence: a randomized controlled trial. Ann Fam Med 2012; 10(1):15-22.* http://www.ncbi.nlm.nih.gov/pubmed/22230826.

This article describes an RCT of an integrated-care intervention (vs. usual care) for 180 patients with type 2 diabetes and depression in urban primary care fee-for-service practices. The intervention was a "blended"-type intervention, with care managers

focusing on education, monitoring, and care coordination for both depression and diabetes. CC had powerful effects on both depression remission rates and lowering hemoglobin A1c levels, compared with usual care.

*Katon WJ, Von Korff M, Lin EH, Simon G, Ludman E, Russo J, Ciechanowski P, Walker E, Bush T. The Pathways Study: a randomized trial of collaborative care in patients with diabetes and depression. Arch Gen Psychiatry 2004;61(10):1042-1049*. http://www.ncbi.nlm.nih.gov/pubmed/15466678.

A key early CC depression RCT in integrated/managed care primary care practices, in this case for patients with diabetes. The intervention in this early trial focused specifically on depression, with care managers providing education, monitoring, and care coordination related to depression but not diabetes. In 329 patients, the depression intervention led to improved depression and QoL, but not to better levels of hemoglobin A1c.

*Davidson KW, Rieckmann N, Clemow L, Schwartz JE, Shimbo D, Medina V, Albanese G, Kronish I, Hegel M, Burg MM. Enhanced depression care for patients with acute coronary syndrome and persistent depressive symptoms: coronary psychosocial evaluation studies randomized controlled trial. Arch Intern Med 2010;170(7):600-608*. http://www.ncbi.nlm.nih.gov/pubmed/20386003.

An RCT of depression care management in 157 patients after diagnosis of acute coronary syndrome at academic medical centers and a Veterans Affairs (VA) hospital. The care management intervention utilized longitudinal assessment of symptoms, evidence-based psychotherapy, and antidepressant pharmacotherapy (prescribed by study clinicians). Intervention led to improvement in depression and a small but significant reduction in major adverse cardiac events by the end of the trial (4% vs. 13%).

*Huffman JC, Mastromauro CA, Sowden G, Fricchione GL, Healy BC, Januzzi JL. Impact of a depression care management program for hospitalized cardiac patients. Circ Cardiovasc Qual Outcomes 2011;4(2):198-205*. http://www.ncbi.nlm.nih.gov/pubmed/21386067.

An RCT of phone-delivered CC initiated in inpatients ($N = 175$) admitted for cardiac illness (acute coronary syndrome, heart failure, and arrhythmia) at an academic medical center and found to have clinical depression. The low-intensity intervention utilized a social work care manager to provide longitudinal care management, care coordination, and support; psychotherapy was not delivered by the care manager. The intervention was associated with significantly greater improvements in depression, anxiety, and mental HRQoL at the end of the 12-week intervention period; at 6 months, intervention patients had fewer cardiac symptoms and better self-reported adherence to medication/lifestyle change; mental health improvements had waned at 6 months.

### *Cancer*

*Strong V, Waters R, Hibberd C, Murray G, Wall L, Walker J, McHugh G, Walker A, Sharpe M. Management of depression for people with cancer (SMaRT oncology 1): a randomised trial. Lancet 2008;372(9632):40-48*. http://www.ncbi.nlm.nih.gov/pubmed/18603157.

An RCT comparing collaborative depression care management to usual care for patients ($N = 196$) with cancer and major depression evaluated in a regional cancer center. The intervention consisted of depression education, longitudinal assessment, nurse-delivered psychotherapy, and antidepressant monitoring/support. Patients receiving the CC intervention had clinically significant 3-month improvements in depression, anxiety, and fatigue but not in function or pain. These benefits of CC were sustained at 6 and 12 months.

*Ell K, Xie B, Quon B, Quinn DI, Dwight-Johnson M, Lee PJ. Randomized controlled trial of collaborative care management of depression among low-income patients with cancer. J Clin Oncol 2008;26(27):4488-4496*. http://www.ncbi.nlm.nih.gov/pubmed/18802161

An RCT of CC ($N = 472$) for low-income (predominantly Hispanic) patients with cancer and depression seen at an academic center that provides oncology care to a low-income, predominantly Hispanic population. The intervention utilized a care management model adapted from the IMPACT model, though study psychiatrists prescribed medications if needed. The intervention was associated with significant reduction in depressive symptoms, improvement in quality of life, and lower pain levels compared with usual care.

### *Infectious Disease*

*Pyne JM, Fortney JC, Curran GM, Tripathi S, Atkinson JH, Kilbourne AM, Hagedorn HJ, Rimland D, Rodriguez-Barradas MC, Monson T, Bottonari KA, Asch SM, Gifford AL. Effectiveness of collaborative*

*care for depression in human immunodeficiency virus clinics. Arch Intern Med 2011;171(1):23-31.* http://www.ncbi.nlm.nih.gov/pubmed/21220657.

An RCT comparing CC with usual care ($N = 249$) for patients with HIV and depression in VA medical centers. The CC intervention was delivered by an offsite team of clinicians who utilized telephone interventions and web-based communication and decision support to patients' primary treatment providers; the care managers provided support but did not specifically provide psychotherapy. CC was associated with significantly reduced depression and HIV symptom severity but not change in HRQoL or adherence to HIV treatment.

### *Pain/Fibromyalgia*

*Dobscha SK, Corson K, Perrin NA, Hanson GC, Leibowitz RQ, Doak MN, Dickinson KC, Sullivan MD, Gerrity MS. Collaborative care for chronic pain in primary care: a cluster randomized trial. JAMA 2009;301(12):1242-1252.* http://www.ncbi.nlm.nih.gov/pubmed/19318652.

A cluster RCT of CC for patients ($N = 401$) with chronic musculoskeletal pain seen in a VA medical center. Intervention patients received an assessment visit with the care manager. The care manager and intervention internist then jointly reviewed assessment results and developed treatment recommendations that were communicated to clinicians, usually through medical record electronic alerts or e-mail. Patients requiring more intensive assessment or specialized care received stepped-care components of greater intensity (e.g., referral of specialty care or direct communication between patient and study clinician). CC improved depression and achieved modest improvements in pain intensity and pain-related disability compared with usual care.

*Kroenke K, Theobald D, Wu J, Norton K, Morrison G, Carpenter J, Tu W. Effect of telecare management on pain and depression in patients with cancer: a randomized trial. JAMA 2010;304(2):163-171.* http://www.ncbi.nlm.nih.gov/pubmed/20628129.

An RCT of phone-delivered CC ($N = 405$) compared with usual care for patients with cancer-related pain or depression seen in community-based urban and rural oncology practices. Patients in the intervention group received centralized telecare management by a nurse-physician specialist team coupled with automated home-based symptom monitoring by interactive voice recording or Internet; the telecare management intervention utilized a standard CC approach with longitudinal assessment and care coordination for both pain and depression. The intervention was associated with significant improvements in both depression and pain intensity at both 3 and 12 months.

*Kroenke K, Bair MJ, Damush TM, Wu J, Hoke S, Sutherland J, Tu W. Optimized antidepressant therapy and pain self-management in primary care patients with depression and musculoskeletal pain: a randomized controlled trial. JAMA 2009;301(20):2099-2110.* http://www.ncbi.nlm.nih.gov/pubmed/19470987.

A stepped-care care management RCT ($N = 250$) for patients with musculoskeletal pain in community-based clinics and 5 VA general medicine clinics. The intervention consisted of 12 weeks of optimized antidepressant therapy followed by 6 sessions of a pain self-management program over 12 weeks, along with a continuation phase for 6 months. The intervention was associated with substantial depression improvement and moderate reductions of pain severity and intensity.

*Martín J, Torre F, Padierna A, Aguirre U, González N, García S, Matellanes B, Quintana JM. Six-and 12-month follow-up of an interdisciplinary fibromyalgia treatment programme: results of a randomised trial. Clin Exp Rheumatol 2012;30(6 Suppl 74):103-111.* http://www.ncbi.nlm.nih.gov/pubmed/23261008.

An RCT of a 6-week, 12-session interdisciplinary integrated-care model that combined medical and psychologic interventions for 153 patients with fibromyalgia in an academic hospital. Compared with patients receiving standard pharmacologic therapy, patients in the intervention arm had significantly greater improvements in quality of life, pain, physical function, anxiety and depression, and pain coping strategies 12 months postintervention.

## Studies of Integrated-Care Models for Other Psychiatric Conditions

### *Anxiety Disorders*

*Roy-Byrne P, Craske MG, Sullivan G, Rose RD, Edlund MJ, Lang AJ, Bystritsky A, Welch SS, Chavira DA, Golinelli D, Campbell-Sills L, Sherbourne CD, Stein MB. Delivery of evidence-based treatment for*

*multiple anxiety disorders in primary care: a randomized controlled trial. JAMA 2010;303(19):1921-1928.* http://www.ncbi.nlm.nih.gov/pubmed/20483968.

An RCT comparing a coordinated care management intervention (Coordinated Anxiety Learning and Management) and usual care for patients ($N = 1004$) with 1 or more anxiety disorders (Panic Disorder (PD), posttraumatic stress disorder (PTSD), Social Anxiety Disorder (SAD), and Generalized Anxiety Disorder (GAD)) with or without Multifaceted Diabetes and Depression. This real-world effectiveness study occurred in 17 primary care (mixed fee-for-service and managed care) sites in 4 U.S. cities; the sites varied in patient characteristics and payer mix. Collaborative care was linked to reduced depression, anxiety, and functional impairment, compared with usual care.

*Rollman BL, Belnap BH, Mazumdar S, Houck PR, Zhu F, Gardner W, Reynolds CF 3rd, Schulberg HC, Shear MK. A randomized trial to improve the quality of treatment for panic and generalized anxiety disorders in primary care. Arch Gen Psychiatry 2005;62(12):1332-1341.* http://www.ncbi.nlm.nih.gov/pubmed/16330721.

An RCT that compared a telephone-based care management intervention to simple notification of diagnosis to patient/treating provider, for patients with panic disorder or generalized anxiety disorder or both ($N = 191$) seen in 4 university-based primary care clinics that shared an electronic medical record. Intervention patients had significantly greater improvements in anxiety, depression, and mental HRQoL, along with increased work attendance, compared with patients receiving usual care, at the 12-month end point.

*Roy-Byrne PP, Craske MG, Stein MB, Sullivan G, Bystritsky A, Katon W, Golinelli D, Sherbourne CD. A randomized effectiveness trial of cognitive-behavioral therapy and medication for primary care panic disorder. Arch Gen Psychiatry 2005;62(3):290-298.* http://www.ncbi.nlm.nih.gov/pubmed/15753242.

An RCT of a combined cognitive behavioral therapy and pharmacotherapy–integrated care intervention for an ethnically and socioeconomically diverse patients with panic disorder ($N = 232$) managed in university-based primary care settings. Participants randomized to the intervention had greater rates of response and remission, along with greater improvements in disability scores, compared with patients assigned to usual care. It is noteworthy that these effects occurred despite similar rates of guideline-concordant pharmacotherapy in both groups.

*Zatzick D, Jurkovich G, Rivara FP, Russo J, Wagner A, Wang J, Dunn C, Lord SP, Petrie M, O connor SS, Katon W. A randomized stepped care intervention trial targeting posttraumatic stress disorder for surgically hospitalized injury survivors. Ann Surg 2013;257(3):390-399.* http://www.ncbi.nlm.nih.gov/pubmed/23222034.

An RCT comparing management of a stepped-care intervention (comprised care management, pharmacotherapy, and cognitive behavioral therapy) with usual care for posttraumatic stress disorder in 207 patients who survived an acute traumatic injury. Over a 12-month period, compared with usual care, the intervention was associated with significantly greater reductions in posttraumatic stress disorder symptoms and greater improvement of physical HRQoL.

### *Bipolar Disorder*

*Bauer MS, McBride L, Williford WO, Glick H, Kinosian B, Altshuler L, Beresford T, Kilbourne AM, Sajatovic M. Collaborative care for bipolar disorder: Part II. Impact on clinical outcome, function, and costs. Psychiatr Serv 2006;57(7):937-945.* http://www.ncbi.nlm.nih.gov/pubmed/16816277.

This was an RCT of a 3-year CC intervention (vs. usual care) for patients ($N = 306$) with bipolar disorder that combined group psychoeducation, clinician decision support, and care coordination via nurse care managers. Participants had severe illness and multiple comorbidities, and they were enrolled via 11 VA inpatient units; they were randomized to CC or usual care at the time of discharge. The intervention was associated with significantly reduced weeks in an active mood episode (primarily mania) and with significant improvements in social role function, mental quality of life, and treatment satisfaction. It is noteworthy that reductions in mean manic and depressive symptoms were not significant. The intervention was cost-neutral while achieving a net reduction of 6 weeks in an affective episode.

*Bauer MS, Biswas K, Kilbourne AM. Enhancing multiyear guideline concordance for bipolar disorder through collaborative care. Am J Psychiatry 2009;166(11):1244-1250.* http://www.ncbi.nlm.nih.gov/pubmed/19797436.

Analysis of the trial mentioned earlier of a CC model in bipolar disorder examining adherence to published treatment guidelines for bipolar/antimanic pharmacotherapy over a 3-year period. Patients randomized to CC had significantly higher rates of guideline-concordant antimanic treatment than usual care at each 6-month follow-up assessment over the study period.

*Simon GE, Ludman EJ, Bauer MS, Unützer J, Operskalski B. Long-term effectiveness and cost of a systematic care program for bipolar disorder. Arch Gen Psychiatry 2006;63(5):500-508*. http://www.ncbi.nlm.nih.gov/pubmed/16651507.

This RCT compared the effect of a 2-year multicomponent CC intervention program aimed at improving the quality of care and long-term outcomes with usual care among 441 persons with bipolar disorder. Participants in the trial were members of 1 of 4 group model behavioral health clinics of a managed care organization. Compared with patients receiving usual care, intervention subjects had fewer and shorter manic symptoms, though no significant change in depressive symptoms was observed; the benefits of the intervention were found only in the subgroup (approximately 75%) who had clinically significant mood symptoms at the baseline assessment. The total adjusted incremental cost of the intervention was estimated to be $1251/patient.

## Underserved, Undertreated, or Underrepresented Populations

*Fortney JC, Pyne JM, Mouden SB, Mittal D, Hudson TJ, Schroeder GW, Williams DK, Bynum CA, Mattox R, Rost KM. Practice-based versus telemedicine-based collaborative care for depression in rural federally qualified health centers: a pragmatic randomized comparative effectiveness trial. Am J Psychiatry 2013;170(4):414-425*. http://www.ncbi.nlm.nih.gov/pubmed/23429924.

This randomized pragmatic comparative effectiveness trial compared the effectiveness of locally provided practice-based CC (on-site PCP and depression care manager) with telemedicine-based CC (on-site PCP and an off-site team [nurse care manager and mental health experts participating via phone and videoconferencing]). Study patients ($N = 364$) with depression were enrolled from fee-for-service sites caring for medically underserved populations without mental health specialists onsite; the off-site team was located at an academic medical center. Patients randomized to the telemedicine intervention had superior depression outcomes, including greater rates of response and remission, in the 18-month trial; improvements in outcomes appeared to be attributable to higher fidelity to the CC evidence base in the telemedicine-based group.

*Cooper LA, Ghods Dinoso BK, Ford DE, Roter DL, Primm AB, Larson SM, Gill JM, Noronha GJ, Shaya EK, Wang NY. Comparative effectiveness of standard versus patient-centered collaborative care interventions for depression among African Americans in primary care settings: the BRIDGE Study. Health Serv Res 2013;48(1):150-174*. http://www.ncbi.nlm.nih.gov/pubmed/22716199.

This cluster RCT compared a standard collaborative model with a patient-centered culturally tailored CC intervention model over 12 months of follow-up. Study participants were African American patients with major depression recruited from 10 urban community-based practices, only 2 of which had on-site mental health services. Both groups showed similar and significant improvements in depression outcomes; standard CC resulted in higher rates of treatment, and patient-centered CC resulted in higher ratings of care by participants.

*Wells KB, Jones L, Chung B, Dixon EL, Tang L, Gilmore J, Sherbourne C, Ngo VK, Ong MK, Stockdale S, Ramos E, Belin TR, Miranda J. Community-partnered cluster-randomized comparative effectiveness trial of community engagement and planning or resources for services to address depression disparities. J Gen Intern Med 2013 [Epub ahead of print]*. http://www.ncbi.nlm.nih.gov/pubmed/23649787.

This was a randomized trial of 2 approaches to foster improved depression care via social- and community-based service providers in underserved populations. Matched programs from health, social, and other service sectors were randomized to community engagement and planning promoting interagency collaboration or resources for services providing individual program technical assistance plus outreach to facilitate implementation of depression QI toolkits. Among 1018 depressed patients identified from 4440 patients in a total of 90 programs, patients in programs that received the community engagement and planning intervention had significantly better mental HRQoL (but no better depression

outcomes) and physical activity, with more primary care visits for mental health treatment (but no better quality of antidepressant medication treatment), while reducing mental health provider visits and hospitalizations.

*Myers K, Stoep AV, Thompson K, Zhou C, Unützer J. Collaborative care for the treatment of Hispanic children diagnosed with attention-deficit hyperactivity disorder. Gen Hosp Psychiatry 2010;32(6):612-614.* http://www.ncbi.nlm.nih.gov/pubmed/21112453.

This was a preliminary, single-arm trial of a CC model for Hispanic children ($N = 116$) with attention-deficit/hyperactivity disorder in a rural and an urban underserved setting. The CC model consisted of on-site care managers fluent in Spanish who consulted with psychiatrists by telephone. The CC model was successfully implemented in both settings, was well-accepted by patients, and was associated with improvements in attention-deficit/hyperactivity disorder symptoms.

*Ell K, Katon W, Xie B, Lee PJ, Kapetanovic S, Guterman J, Chou CP. Collaborative care management of major depression among low-income, predominantly Hispanic subjects with diabetes: a randomized controlled trial. Diabetes Care 2010;33(4):706-713.* http://www.ncbi.nlm.nih.gov/pubmed/20097780.

An RCT of CC for depressed, low-income (97% Hispanic) patients ($N = 387$) with diabetes mellitus. Patients were recruited from 2 public safety-net clinics. The intervention group was associated with superior outcomes related to depression, anxiety, HRQoL, and functional status, though not hemoglobin A1c level, diabetes complications, self-care, or body mass index.

*Gensichen J, von Korff M, Peitz M, Muth C, Beyer M, Güthlin C, Torge M, Petersen JJ, Rosemann T, König J, Gerlach FM; PRoMPT (PRimary care Monitoring for depressive Patients Trial). Case management for depression by health care assistants in small primary care practices: a cluster randomized trial. Ann Intern Med 2009;151(6):369-378.* http://www.ncbi.nlm.nih.gov/pubmed/19755362.

This was a cluster RCT of depression care management for patients enrolled from 74 primary care practices in Germany. Among 555 primary care patients included in a modified intent-to-treat analysis, CC was associated with significantly greater improvements in depression symptoms, treatment adherence, and satisfaction with care, compared with usual care. Quality of life did not improve significantly in the intervention arm.

*Asarnow JR, Jaycox LH, Duan N, LaBorde AP, Rea MM, Murray P, Anderson M, Landon C, Tang L, Wells KB. Effectiveness of a quality improvement intervention for adolescent depression in primary care clinics: a randomized controlled trial. JAMA 2005;293(3):311-319.* http://www.ncbi.nlm.nih.gov/pubmed/15657324.

This RCT compared a CC depression intervention for adolescents (13–21 years old) with depression care as usual (total $N = 418$). Patients were selected from 5 diverse sites that included managed care, public sector, and academic medical center settings. The intervention was associated with improved depression and mental HRQoL vs. usual care.

## Integrated-Care Programs for Medical Care of Patients with Serious Mental Illness

*Druss BG, von Esenwein SA, Compton MT, Rask KJ, Zhao L, Parker RM. A randomized trial of medical care management for community mental health settings: the Primary Care Access, Referral, and Evaluation (PCARE) study. Am J Psychiatry 2010;167(2):151-159.* http://www.ncbi.nlm.nih.gov/pubmed/20008945.

An RCT of a medical care management intervention designed to improve primary medical care in patients ($N = 407$) with severe mental illness at an urban community mental health center. Compared with usual care, CC was associated with increased preventive services, improved cardiac risk index and better mental, but not physical, HRQoL.

*Kilbourne AM, Goodrich DE, Lai Z, Clogston J, Waxmonsky J, Bauer MS. Life Goals Collaborative Care for patients with bipolar disorder and cardiovascular disease risk. Psychiatr Serv. 2012;63(12):1234-1238.* http://www.ncbi.nlm.nih.gov/pubmed/23203358.

This was a pilot study ($N = 68$) exploring the effect of a CC intervention targeting cardiometabolic risk factors in patients with bipolar disorder and cardiac risk factors. Compared with enhanced treatment as usual, the intervention was not associated with reductions in cardiometabolic risk factors in 12-month repeated-measures analyses. There were promising effects in a subgroup of patients (high body mass

index or hypertension) with respect to functional and mood symptoms.

*Druss BG, Rohrbaugh RM, Levinson CM, Rosenheck RA. Integrated medical care for patients with serious psychiatric illness: a randomized trial. Arch Gen Psychiatry 2001;58(9):861-868.* http://www.ncbi.nlm.nih.gov/pubmed/11545670.

This was an RCT that evaluated an integrated model of primary medical care for a cohort of 120 patients with serious mental illness. Patients were randomized to receive primary medical care through an integrated-care initiative located in the mental health clinic or the VA general medicine clinic. Veterans who obtained care in the integrated-care clinic received on-site primary care and case management that emphasized preventive medical care, patient education, and close collaboration with mental health providers. Patients treated in the integrated-care clinic were significantly more likely to have made a primary care visit, had a greater mean number of visits, and were more likely to have received preventive measures outlined in clinical practice guidelines. Integrated-care clinic patients also had a significantly greater improvement in physical HRQoL (SF-36). There were no significant differences between the 2 groups in mental health symptoms or total health care costs.

*Mueser KT, Pratt SI, Bartels SJ, Swain K, Forester B, Cather C, Feldman J. Randomized trial of social rehabilitation and integrated health care for older people with severe mental illness. J Consult Clin Psychol 2010;78(4):561-573.* http://www.ncbi.nlm.nih.gov/pubmed/20658812.

This RCT ($N = 187$) compared a care management intervention for older adults with serious mental illness (HOPES) that focused on improving social functioning and providing medical care management with treatment as usual. Participants lived in the community and were recruited via 3 public mental health agencies (2 urban and 1 rural). Intervention patients had improvement of self-reported social skills, psychosocial and community functioning, negative symptoms, and self-efficacy; medical outcomes were not assessed.

## Implementation Studies

*Grypma L, Haverkamp R, Little S, Unützer J. Taking an evidence-based model of depression care from research to practice: making lemonade out of depression. Gen Hosp Psychiatry 2006;28(2):101-107.* http://www.ncbi.nlm.nih.gov/pubmed/16516059.

An adapted IMPACT model was clinically implemented 3 years after the IMPACT study at 3 HMO sites involving 297 patients; patients receiving this real-world intervention had improvements in depression similar to those of participants who had received it in the RCT.

*Solberg LI, Glasgow RE, Unützer J, Jaeckels N, Oftedahl G, Beck A, Maciosek MV, Crain AL. Partnership research: a practical trial design for evaluation of a natural experiment to improve depression care. Med Care 2010;48(7):576-582.* http://www.ncbi.nlm.nih.gov/pubmed/20508531.

This article describes the major DIAMOND clinical implementation project that resulted in the utilization of the CC model for depression by all major health plans in the state of Minnesota, with 1500 enrolled patients and 85 clinics. The implementation process, challenges, and successes are detailed.

*Luck J, Hagigi F, Parker LE, Yano EM, Rubenstein LV, Kirchner JE. A social marketing approach to implementing evidence-based practice in VHA QUERI: the TIDES depression collaborative care model. Implement Sci 2009;4:64.* http://www.ncbi.nlm.nih.gov/pubmed/19785754.

A description of the implementation of the TIDES CC depression initiative within the VA system. It is currently in use in more than 50 primary care practices across the United States, and continues to spread via a social marketing-based dissemination strategy.

*Unützer J, Chan YF, Hafer E, Knaster J, Shields A, Powers D, Veith RC. Quality improvement with pay-for-performance incentives in integrated behavioral health care. Am J Public Health 2012;102(6):e41-e45.* http://www.ncbi.nlm.nih.gov/pubmed/22515849.

This article describes outcomes associated with a pay-for-performance incentive program linked to a large CC depression management program demonstration project in over 130 federally qualified primary care clinics across Washington state. After implementation of the pay-for-performance incentive program, participants were more likely to experience timely follow-up and to achieve depression response, and the time to depression improvement was significantly reduced.

*Korsen N, Pietruszewski P. Translating evidence to practice: two stories from the field. J Clin Psychol Med Settings 2009;16(1):47-57.* http://www.ncbi.nlm.nih.gov/pubmed/19238525.

Two organizational case studies focused on clinical implementation of the IMPACT model in adults with depression that illustrate lessons about translating evidence to practice. The authors describe successes and challenges related to such implementation.

*Fortney J, Enderle M, McDougall S, Clothier J, Otero J, Altman L, Curran G. Implementation outcomes of evidence-based quality improvement for depression in VA community based outpatient clinics. Implement Sci 2012;7:30*. http://www.ncbi.nlm.nih.gov/pubmed/22494428.

This study evaluated an evidence-based quality improvement approach to specifically tailor CC programs (which were mandated in these Department of VA clinics) to 11 specific community sites, as a strategy to facilitate the adoption of collaborative care management at these sites. The approach used clinical and administrative staff members who were familiar with the CC model to assist in the tailored implementation of the program. This approach led to good uptake of the CC model with most providers referred at least 1 patient, high rates of fidelity to the CC procedures, and clinical outcomes similar to those seen in research settings.

*Zivin K, Pfeiffer PN, Szymanski BR, Valenstein M, Post EP, Miller EM, McCarthy JF. Initiation of Primary Care-Mental Health Integration programs in the VA Health System: associations with psychiatric diagnoses in primary care. Med Care 2010;48(9):843-851*. http://www.ncbi.nlm.nih.gov/pubmed/20706160.

An analysis of rates of psychiatric diagnosis in VA clinics in 2008 with ($N = 137$ clinics) and without ($N = 157$) CC mental health management programs. Analysis revealed that diagnoses of depression, anxiety, posttraumatic stress disorder, and alcohol abuse increased substantially over time in the 137 facilities with CC programs; outcomes were not assessed.

*Kathol RG, Butler M, McAlpine DD, Kane RL. Barriers to physical and mental condition integrated service delivery. Psychosom Med 2010;72(6):511-518*. http://www.ncbi.nlm.nih.gov/pubmed/20498293.

This comprehensive survey of key staff members at 11 nationally established primary care programs with integrated mental and physical health programs assessed barriers to the delivery of such integrated care and the necessary components for success. Financial barriers created by segregated mental and physical health reimbursement practices were easily the greatest barrier to delivery.

*Sanchez K, Thompson S, Alexander L. Current strategies and barriers in integrated health care: a survey of publicly funded providers in Texas. Gen Hosp Psychiatry 2010;32(1):26-32*. http://www.ncbi.nlm.nih.gov/pubmed/20114125.

A survey of behavioral health and primary care provider organizations in Texas conducted to examine providers' perceptions of efforts to integrate physical and mental health. A total of 84 organizations responded; most utilized similar (and proven) approaches to implementation of integrated care, and workforce and funding issues were the greatest barriers to success.

*Richards DA, Suckling R. Improving access to psychological therapies: phase IV prospective cohort study. Br J Clin Psychol 2009;48(Pt 4):377-396*. http://www.ncbi.nlm.nih.gov/pubmed/19208291.

A prospective evaluation of implementation of a phone-based integrated mental health assessment/stepped-care treatment program for anxiety and depression at a demonstration site in the UK that involved 3994 patients. Implementation was successful, and the program was well-accepted by patients and staff. Effect sizes (pre-post) on depression and anxiety were $\sim$1.4 and response rates $\sim$75%.

*Reiss-Brennan B, Briot PC, Savitz LA, Cannon W, Staheli R. Cost and quality impact of Intermountain's mental health integration program. J Healthc Manag 2010;55(2):97-113*. http://www.ncbi.nlm.nih.gov/pubmed/20402366.

A discussion of a specific and successful mental health–integration program developed in the Intermountain health care system. Patients in the clinics with this program had improved care satisfaction, lower costs, and better quality outcomes.

## Cost-Effectiveness Studies and Reviews

*Katon WJ, Schoenbaum M, Fan MY, Callahan CM, Williams J Jr, Hunkeler E, Harpole L, Zhou XH, Langston C, Unützer J. Cost-effectiveness of improving primary care treatment of late-life depression. Arch Gen Psychiatry 2005;62(12):1313-1320*. http://www.ncbi.nlm.nih.gov/pubmed/16330719.

An assessment of net benefits and costs related to the IMPACT trial over 24 months. Relative to usual care, intervention patients experienced significantly more depression-free days over the 2-year period. Total outpatient costs were $295 higher during this interval, with an incremental outpatient cost per

depression-free day of $2.76, suggesting that this is a highly cost-effective intervention.

*Unutzer J, Katon WJ, Fan MY, Schoenbaum MC, Lin EH, Della Penna RD, Powers D. Long-term cost effects of collaborative care for late-life depression. Am J Manag Care 2008;14(2):95-100.* http://www.ncbi.nlm.nih.gov/pubmed/18269305.

An analysis of total health care costs over 4 years among IMPACT participants ($N = 551$) at the 2 sites for which 4-year cost data were available. Intervention patients had lower health care costs (by ~$3000/patient) than those receiving usual care.

*Simon GE, Katon WJ, Lin EH, Rutter C, Manning WG, Von Korff M, Ciechanowski P, Ludman EJ, Young BA. Cost-effectiveness of systematic depression treatment among people with diabetes mellitus. Arch Gen Psychiatry 2007;64(1):65-72.* http://www.ncbi.nlm.nih.gov/pubmed/17199056.

An analysis of outpatient health care costs (and depression-free days) for patients in the Pathways trial ($N = 329$). Intervention patients had ~$300 less health care costs than those receiving usual care. Intervention subjects also had 61 more depression-free days, with likely additional financial benefit as a result.

*Katon W, Russo J, Lin EH, Schmittdiel J, Ciechanowski P, Ludman E, Peterson D, Young B, Von Korff M. Cost-effectiveness of a multicondition collaborative care intervention: a randomized controlled trial. Arch Gen Psychiatry 2012;69(5):506-514.* http://www.ncbi.nlm.nih.gov/pubmed/22566583.

A cost analysis of TEAMcare examining cost-related outcomes at 24 months. Intervention patients had 114 additional depression-free days, 0.335 additional quality-adjusted life-years (QALYs), and lower mean outpatient health costs of $594 per patient, relative to usual care patients.

*Simon GE, Ludman EJ, Rutter CM. Incremental benefit and cost of telephone care management and telephone psychotherapy for depression in primary care. Arch Gen Psychiatry 2009;66(10):1081-1089.* http://www.ncbi.nlm.nih.gov/pubmed/19805698.

A cost analysis of a trial examining 2 programs, 1 utilizing telephone depression care management and 1 utilizing care management plus phone psychotherapy ($N = 600$). Telephone care management was linked to a gain of 29 depression-free days and an increase of $676 in outpatient health care costs. Care management plus psychotherapy led to a gain of 46 depression-free days and an increase of $397 in outpatient costs.

*Pyne JM, Fortney JC, Tripathi SP, Maciejewski ML, Edlund MJ, Williams DK. Cost-effectiveness analysis of a rural telemedicine collaborative care intervention for depression. Arch Gen Psychiatry 2010;67(8):812-821.* http://www.ncbi.nlm.nih.gov/pubmed/20679589.

A cost analysis of a rural telemedicine-based CC depression intervention over 12 months. The intervention was effective but not significantly associated with more depression-free days ($p = 0.10$) and was substantially more expensive ($85K/QALY) than other integrated-care programs.

*Katon W, Unützer J, Fan MY, Williams JW Jr, Schoenbaum M, Lin EH, Hunkeler EM. Cost-effectiveness and net benefit of enhanced treatment of depression for older adults with diabetes and depression. Diabetes Care 2006;29(2):265-270.* http://www.ncbi.nlm.nih.gov/pubmed/16443871.

A subanalysis of the 418 patients in IMPACT who had diabetes. Relative to usual care, intervention patients experienced 115 more depression-free days over 24 months. Total outpatient costs were $25 higher during this same period, making the incremental cost per depression-free day 25 cents and suggesting that this intervention was highly cost effective in this cohort.

*Hay JW, Katon WJ, Ell K, Lee PJ, Guterman JJ. Cost-effectiveness analysis of collaborative care management of major depression among low-income, predominantly Hispanics with diabetes. Value Health 2012;15(2):249-254.* http://www.ncbi.nlm.nih.gov/pubmed/22433755.

A cost analysis of the Multifaceted Diabetes and Depression Program in a low-income, primarily Latino, population. Overall increased costs of study intervention were $515 per patient, approximately $12 per depression-free day. The program's cost-effectiveness averaged $4053 per quality-adjusted life-year per Multifaceted Diabetes and Depression Program recipient, well below the established line of $12,000 per QALY for cost-effectiveness.

*Katon W, Russo J, Sherbourne C, Stein MB, Craske M, Fan MY, Roy-Byrne P. Incremental cost-effectiveness of a collaborative care intervention for panic disorder. Psychol Med 2006;36(3):353-363.* http://www.ncbi.nlm.nih.gov/pubmed/16403243.

A 12-month cost analysis of an integrated-care cognitive behavioral therapy plus medication intervention for panic disorder ($N = 232$). Intervention patients experienced 60 more anxiety-free days, outpatient costs were $492 higher, and cost per QALY was 14,158 USD, suggesting marginal/moderate cost-effectiveness.

*Jacob V, Chattopadhyay SK, Sipe TA, Thota AB, Byard GJ, Chapman DP; Community Preventive Services Task Force. Economics of collaborative care for management of depressive disorders: a community guide systematic review. Am J Prev Med 2012; 42(5):539-549.* http://www.ncbi.nlm.nih.gov/pubmed/22516496.

A review of cost analyses performed as part of 30 CC trials. Overall, there were more "positive" than "negative" results with regard to reduced health care use, averted productivity loss, and cost-effectiveness (using $50,000/QALY, the standard threshold) in CC patients. The analysis concluded that this model provides very good economic value.

## Useful Websites for More Information on Implementing Integrated Depression Care Programs

http://www.teamcarehealth.org/. Website with research results, resources, and training opportunities related to the TEAMcare-blended (depression and medical management) care management model.

http://impact-uw.org/. Site with research results, resources, and training opportunities related to the IMPACT depression care management model in older adults, which has now been clinically implemented across the country in a wide variety of settings.

http://www.icsi.org/health_care_redesign_/diamond_35953/diamond_frequently_asked_questions_/. Information/FAQs about the DIAMOND project that has resulted in clinical implementation of collaborative depression care management across Minnesota.

http://www.bypassingtheblues.pitt.edu/. Website with information for patients, clinicians, and researchers related to the large Bypassing the Blues CC trial for post-CABG depression.

http://uwaims.org/. Site from the AIMS center at UW, which describes the large-scale dissemination of depression CC in over 100 federally qualified primary care clinics in Washington state.

## DISCUSSION

Overall, it is clear that in research settings—and increasingly in clinical care—CC interventions are feasible, well accepted, cost effective, and successful in improving outcomes. It is noteworthy that those integrated-care interventions that target both mental health and chronic medical illness may have superior outcomes compared with those that target a single psychiatric disorder. For example, the TEAMcare-blended care management intervention that targeted both depression and the medical condition (diabetes or heart failure) actually had substantially greater effects on depression compared with the depression-only care management intervention (Pathways) for patients with depression and diabetes performed by the same group.

Although there is now robust evidence of the effectiveness of CC models in improving quality of mental health care and mental health (and often physical health) outcomes, lack of third-party reimbursement for care manager time and physician supervision time has slowed dissemination of these models of care. However, insurers in Washington state and Minnesota have developed mechanisms to bill for these services, which has stimulated widespread dissemination in these 2 states. Health reform initiatives such as the Patient Centered Medical Home, Accountable Care Organizations, and decreasing Medicare payments for hospital systems that have higher percentages of 30-day readmissions are also stimulating dissemination of these models of care.

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