

Effective Implementation of Collaborative Care for Depression: What Is Needed?

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There is extensive evidence from randomized controlled trials that collaborative care for depressed adults in primary care improves patient outcomes.¹⁻⁵ Key elements in evidence-based collaborative care programs include consistent measurement and monitoring of depression severity, close proactive follow-up by a clinic-based care manager, and regular psychiatric consultation focused on treatment changes for patients who are not improving with initial treatment. Based on these studies, the US Preventive Services Task Force recommends that routine screening of adults for depression is justified only when systems for collaborative depression care are in place.^{6,7} Not only can collaborative care produce better patient outcomes (with rates of remission and response that are approximately twice those of usual care), but it can also produce net cost savings over 4 years.⁸⁻¹⁰

Despite these findings, however, little is known about which implementation factors are most important for achieving these outcomes. For example, prior studies of collaborative care have employed care managers with wide varieties of education and experience without providing information about comparative benefits on outcomes.^{1,4} It is also unclear what supports a care manager needs to function most effectively or whether it is important for the psychiatrist to be on-site to provide consultation and supervision. Similarly, it is unknown whether an effective local primary care champion or face-to-face communication between the primary care provider (PCP) and care manager are important.

Between 2008 and 2012, an initiative led by a regional quality improvement collaborative, the Institute for Clinical Systems Improvement (ICSI), systematically provided standardized training in implementing collaborative depression care and consultative support for primary care clinics throughout Minnesota and western Wisconsin. The initiative, Depression Improvement Across Minnesota – Offering a New Direction (DIAMOND), included payment redesign-

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.

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Take-Away Points

Nine implementation factors were most important for the success of the collaborative care model for depression and differed for patient activation into the program versus achieving remission at 6 months.

- Strong leadership support and a strong physician champion are essential for patient activation into the program.
- The more well defined and implemented the care manager role, the higher the rate of patient activation.
- The more engaged a psychiatrist was and the more often in-person communication occurred, the more frequently patients experienced remission from their depression.
- The less likely a group experienced operating costs as a barrier, the more likely their patients were to experience remission.

through a partnership with nearly all commercial health plans in the state.^{11,12} While maintaining fidelity to the core aspects of the model was required, local tailoring was considered important, so there were significant variations in implementation. The initiative also collected standardized process and outcomes data as part of the quality improvement support system, as well as information about each clinic's approach to the care model. This quantitative information was supplemented with a round of site visits to all participating groups, providing a unique opportunity to document differences in care processes and implementation strategies. This information allowed examination of which approaches to implementation might be important for high levels of enrollment and good patient outcomes.

METHODS

Background

The DIAMOND initiative was created in 2006 by a diverse stakeholder group convened by ICSI that included health plans, medical clinics, patients, and employers, with the goal of planning a new approach to depression care. After extensive reviews and discussions, it became clear that both the collaborative care model and payment redesign were needed. The group recommended that payers provide a monthly fee to DIAMOND-certified sites for eligible patient-members enrolled in the care model.

The structure of the initiative was based largely on the collaborative care model as it was tested in the Improving Mood-Promoting Access to Collaborative Treatment (IMPACT) study.^{10,13-17} It focused on 6 components: 1) use of the Patient Health Questionnaire-9 (PHQ-9)¹⁸ for assessment and ongoing monitoring; 2) use of a registry for systematic tracking of patients; 3) use of evidence-based guidelines to provide stepped care treatment modification/intensification; 4) relapse prevention education; 5) a care manager located in the clinic to provide education, care coordination, behavioral activation, and support of

medication management; and 6) a consulting psychiatrist to meet with the care manager for weekly case review and treatment change recommendations.

ICSI conducted training for 5 sequences of clinics participating in the new model over the course of 2 years; every 6 months a new sequence started the 6-month training and implementation program, beginning in September 2007 and continuing until the final sequence started implementation in March 2010. Each sequence consisted of 10 to 26 clinics. In Minnesota nearly all PCPs are organized into single or multispecialty organizations termed "medical groups" that include a number of clinics or practice sites; small, independent practices are rare. A total of 99 clinics representing 21 different medical groups implemented the program.

Design

Each clinic provided standardized monthly data reports through a common Internet portal about the number of patients seen by the care coordinator, the number enrolled in DIAMOND (activation rate), and the PHQ-9 scores (needed to calculate response [change in PHQ-9] and remission [PHQ-9 <5] rates at 6 and 12 months). These quantitative data were supplemented with interview data from a round of site visits in 2009-2010 to all medical groups. For this analysis, we focused on medical groups who had completed all site visits and had at least 50 patients in their DIAMOND program (7 had <50) for a total of 42 clinics from 14 medical groups. The local Institutional Review Board reviewed and approved this study.

Activation and Remission Data

Activation rate was defined as the number of eligible patients (PHQ-9 ≥ 10) who entered DIAMOND per PCP full-time equivalent per month (PCP FTE/M). Remission rates (defined as PHQ-9 <5) were calculated at 6 months post activation. To calculate the overall activation and remission rates for each medical group, the monthly rates were averaged for the period of March 2008 to September 2010.

Qualitative Data Collection

At least 2 ICSI staff attended each site visit, and all clinics were provided with materials prior to the site visit meeting. Materials included sequence-specific outcomes data; an overall DIAMOND data report strategies each group used in implementation; and a discussion guide

■ **Table 1. Factors Considered Important for Implementation of DIAMOND**

Ranking	Implementation Factor	Definition
1	Operating costs of DIAMOND not seen as a barrier	The clinic has adequate coverage or other financial resources for most patients to be able to afford the extra operational costs.
2	Engaged psychiatrist	The consulting psychiatrist is responsive to the care manager and to all patients, especially those not improving.
3	Primary care provider (PCP) “buy-in”	Most clinicians in the clinic support the program and refer patients to it.
4	Strong care manager	The care manager is seen as the right person for this job and works well in the clinic setting.
5	Warm handoff	Referrals from clinicians to the care manager are usually conducted face-to-face rather than through indirect means.
6	Strong top leadership support	Clinic and medical group leaders are committed and support the care model.
7	Strong PCP champion	There is a PCP in the clinic who actively promotes and supports the project.
8	Care manager role well defined and implemented	The care manager job description is well defined, with appropriate time, support, and a dedicated space.
9	Care manager on-site and accessible	The care manager is present and visible in the clinic and is available for referrals and patient care problems.

DIAMOND indicates Depression Improvement Across Minnesota—Offering a New Direction.

focused on barriers and facilitators. The latter included questions about practice culture; team approach; care manager role and duties; medical/psychiatric complexities of patients; psychiatry consults; care coordination; registry use; and approach to financial issues (see [eAppendix](#) available at www.ajmc.com). Site visit meetings included the core team participating in training and implementation, which included the project lead, care manager, and PCP champion. Other staff encouraged to attend were other physicians, the consulting psychiatrist, and the quality improvement lead.

Following each site visit, ICSI staff completed a structured qualitative narrative to document their assessment of factors affecting implementation. This narrative focused on their perceptions of the implementation strategies, barriers, and facilitators, noting information about team dynamics, staff concerns, clinic staff response to the program, and their overall impression of program implementation at the site. Summaries were then prepared by the ICSI site-visit teams and were reviewed by the entire study team.

Implementation Factors

Twenty-three factors were initially identified in the structured qualitative narratives. The analysis team and ICSI staff ($n = 8$) then used a modified Delphi method to identify, multi-vote, and rank factors believed to be most related to successful implementation of DIAMOND (see [Table 1](#)).

Following identification of these factors, a Likert scale rating system was used to determine the extent to which each factor was present in each medical group, from 0 (absent implementation) to 4 (full implementation). ICSI staff rated each medical group on each of the 9 top implementation factors.

Data Analysis

To assess the association between implementation factors and activation and remission rates, we calculated Pearson correlation coefficients between each implementation factor and activation and remission rates. Scatter plots were used to understand the form of the relationship for all associations. Simple linear regression was used to estimate the effect of each 1-point increase (on a scale of 0-4) in implementation on activation and remission rates at 6 months. All reported P values are 2-sided and considered significant at $P < .05$.

RESULTS

This analysis focuses on the 14 medical groups implementing DIAMOND that had 50 or more patients in their program. The majority were multispecialty medical groups (79%) located in the Twin Cities metropolitan area (57%). The number of clinics implementing the program in each group, the PCP FTE/M count of each, and activation and remission rates are shown in [Table 2](#). On average, about 1 patient was activated per PCP FTE/M,

Table 2. Activation per PCP FTE and Remission Rate at 6 Months for 14 Medical Groups, March 2008 to September 2010

Medical Group	No. of Clinics	No. of PCP FTEs	No. of Patients 6-month Follow-up	Activation Rate (PCP FTE/M)	Remission Rate
1	1	7.0	67	0.4	20.7
2	5	26.5	496	1.0	23.3
3	7	35.7	1192	1.2	22.3
4	3	18.0	182	0.4	15.7
5	3	21.5	177	0.4	9.0
6	1	22.1	118	0.4	42.9
7	2	16.0	136	0.7	29.8
8	4	18.9	606	1.2	42.1
9	2	9.0	109	1.0	22.0
10	2	23.0	1099	1.9	45.4
11	1	6.5	92	0.7	18.5
12	2	22.0	242	0.4	21.8
13	5	16.0	130	0.4	5.6
14	4	9.0	612	2.8	6.6
Total	42	251.1	5258		
Mean	3.0	17.9	376	0.9	23.2
Median	2.5	18.5	180	0.7	22.3
Min	1	6.5	67	0.4	5.6
Max	7	35.7	1192	2.8	45.4

PCP FTE indicates primary care provider full-time equivalent. Primary care provider is any primary care provider for adults (>18 years age)—such as medical doctor, doctor of osteopathy, physician assistant, nurse practitioner, or advanced practice nurse—who can bill for medical services.

and 23% of patients activated into the program were in remission at 6 months. In keeping with the approach of allowing local tailoring, features of the care manager role varied across program sites. Of the 32 care managers in these medical groups, there were registered nurses (n = 15, 47%), licensed practical nurses/certified medical assistants (n = 11, 34%), and licensed social workers/bachelor’s-level psychologists (n = 6, 19%). The majority (72%) had their DIAMOND care manager role as their primary duty, while 28% had other shared clinical duties. Most care managers (59%) worked with patients from a single clinic, with the remaining (41%) working with patients from several clinics.

Implementation Factors and Patient Activation and Remission. Correlation analysis showed statistically significant and moderately strong positive correlations for 5 of the implementation factors with patient activation into the program: strong leadership support, strong care manager, care manager role well defined and implemented, care manager on-site and accessible, and strong PCP

champion (see **Table 3**). We conducted simple linear regression of significant correlations to estimate the effect of increases in scale rating (rating scale 0-4) of implementation factors. Each of these factors was associated with about a 0.4 increase in activation rate.

Correlation analysis also showed statistically significant and moderately strong positive correlations between 3 implementation factors and patient remission rates at 6 months: engaged psychiatrist, warm handoffs (meaning referrals from clinicians to the care manager are usually conducted face-to-face rather than through indirect means), and operating costs not seen as a barrier (see **Table 4**). Simple linear regression to estimate the effect of an additional increase in scale rating (rating scale 0-4) on remission showed that the less often a medical group experienced operating costs as a barrier, the more likely their patients were to experience remission. Similarly, the more engaged a psychiatrist was and the more often warm handoffs occurred, the more likely patients experienced remission from their depression.

Table 3. Correlation of Implementation Factors With Patient Activation Into the DIAMOND Program

Implementation Factor	Correlation Coefficient	95% CI
Operating cost not seen as a barrier	0.35	-0.22 to 0.74
Engaged psychiatrist	0.23	-0.35 to 0.68
Widespread PCP "buy-in"	0.43	-0.13 to 0.78
Strong care manager	0.58 ^a	0.07-0.85
Warm handoff	0.38	-0.19 to 0.75
Strong leadership support	0.63 ^a	0.15-0.87
Strong PCP champion	0.60 ^a	0.10-0.86
Care manager role well defined & implemented	0.62 ^a	0.14-0.87
Care manager on-site and accessible	0.59 ^a	0.08-0.85

DIAMOND indicates Depression Improvement Across Minnesota—Offering a New Direction; PCP, primary care provider.
^aStatistically significant result, $P < .05$.

Table 4. Correlation of Implementation Factors With Remission Rates at 6 Months in the DIAMOND Program

Implementation Factor	Correlation Coefficient	95% CI
Operating costs not seen as a barrier	0.56 ^a	0.04-0.84
Engaged psychiatrist	0.62 ^a	0.13-0.87
PCP "buy-in"	0.50	-0.04 to 0.81
Strong care manager	0.48	-0.06 to 0.81
Warm handoff	0.54 ^a	0.01-0.83
Strong leadership support	0.43	-0.15 to 0.78
Strong PCP champion	0.40	-0.16 to 0.77
Care manager role well defined & implemented	0.35	-0.22 to 0.74
Care manager on-site and accessible	0.32	-0.26 to 0.73

DIAMOND indicates Depression Improvement Across Minnesota—Offering a New Direction; PCP, primary care provider.
^aStatistically significant result, $P < .05$.

DISCUSSION

Nine factors were considered important for implementation of the DIAMOND collaborative care model, broadly including areas of leadership, care management, physician engagement, and financial issues. Our findings show that the implementation factors significantly correlated with patient activation were different from the factors correlated with 6-month remission. Having strong leadership support, a strong PCP champion, a strong care manager whose role is both well defined and implemented, and a care manager who is on-site and accessible were significantly correlated with activating patients into the program. On the other hand, having an engaged psychiatrist, warm handoffs, and not seeing operating costs as a barrier were significantly correlated with depression remission at 6 months.

Program implementation is a vital component of building effective collaborative care for depression, although much of the research to date has focused on outcomes,

sustainability, and cost-effectiveness.^{1,19-21} A review of multisite studies outlined specific implementation steps and decisions needed to tailor collaborative care for local needs.²² A study of collaborative care in the Netherlands identified factors that facilitated implementation, including continuous supervision of care managers, a supportive Web-based tracking system, and a reimbursement system allowing payment for mental health practitioners.²³ A qualitative analysis of implementation activities in 42 organizations found sites averaged 30 different implementation efforts with modest intensity.²⁴ There are no previous studies identifying specific factors in implementation and how they relate to patient activation and remission outcomes.

Remission of depressive symptoms has long been the primary focus for successful programs receiving significant attention, but activation (enrollment) of patients into the program is equally important. Across the entire DIAMOND initiative, enrollment of eligible patients with depression averaged about 15%, or fewer than 1 out

of 6 eligible patients, with activation rates varying among medical groups and only a few exceeding 20%.¹² Thus, while improved remission rates were good, the overall impact of the program was limited by relatively low activation rates of eligible patients. A focus on both activation and remission could provide a stronger foundation for success and ongoing program support.

Our data show that strong organizational leadership was the most important factor in patient activation; it has long been identified with program success. Providing ongoing institutional support and direction helps lay the foundation on which programs can build.²⁵ Organizational structure and leadership support are the most common facilitators of success for improving the treatment of depression in primary care.²⁶ Expert team leadership and support from local management also strongly influence the success of programs for improving depression care.²⁷ We found that a strong PCP champion for depression care is important for overcoming barriers in the clinic setting and can encourage PCPs to refer their depressed patients to the care manager.²⁸ Resistance by individual physicians to sharing the care of their patients with a care manager can be a significant barrier to patient activation.

The care manager is a critical element in any collaborative care program.²³ Our data show that important components for patient activation are having a care manager whose role is clearly defined and well implemented and who is onsite. Recognizing that collaborative care is a specific model of care with systematic processes is essential, as it sets a clear process for how the care manager role is implemented in the clinic setting.²⁹ Clearly defining the care manager role supports the care manager and clarifies how he or she will be interacting with both patients and other clinic personnel. This provides an important foundation for communication and interaction and the basis for a successful team.

While having the care manager on-site and available was associated with activation, in-person communication with the PCP was more highly correlated with remission. Theoretically, in-person communication might have been expected to be more likely to affect patient activation than remission, since it develops the relationship between the PCP and care manager and facilitates patient acceptance of the care manager. However, it may be that it has a greater effect on remission instead because it provides a foundation for stronger working relationships between providers regarding ongoing patient care. Previous studies have similarly found that collaborative mental healthcare is most successful when clinicians are colocated in the clinic setting.³⁰

Having an engaged psychiatrist was also strongly as-

sociated with patient remission. Engagement by a psychiatrist can provide important and ongoing support for the patient, care manager, and treating PCP. Engaged psychiatric consultants can help address concerns about psychiatric diagnosis or treatment as they arise, make recommendations about adjusting treatments if patients are not improving, and help problem-solve challenging care situations. This consultation builds the expertise of the care manager and PCP, and it can evolve into effective long-term working relationships. Collaborative care managers working with high-risk mothers with depression found they highly valued psychiatric expertise and needed increased psychiatric support with patients of higher complexity to improve care and outcomes.³¹

Not seeing operating costs as a barrier was also highly correlated with remission rates. As with face-to-face communication, this factor may initially appear more directly related to the activation of patients, given that reimbursement for DIAMOND care was contingent on whether a patient's health plan provided this coverage. Many clinics, however, provided DIAMOND care for patients even without payment coverage, potentially decreasing the association of cost considerations with activation. Costs for ongoing care provided by care managers were absorbed into overall program costs in these clinics and covered by the clinic or medical group. It may be that clinics which took this approach and provided ongoing services to all patients, regardless of coverage or ability to pay, demonstrated higher remission rates because of that commitment to better outcomes.

There are limitations to this study that warrant caution in interpretation of these results. The identification of implementation factors was based on subjective ratings, albeit by the people most familiar with the operational issues of this model. The sample size for the analysis is small and focused on medical groups composed of individual heterogeneous clinics. Finally, we have little information about other factors that may have contributed to activation or remission rates, such as patient characteristics or other organizational factors. While we acknowledge these limits, we also note that there are strengths to mixed-method approaches like this, such as the unique opportunity to study real-world settings in all their complexity and to take advantage of the expertise and skill of both the program and the clinic staff.

Collaborative care has been shown to be both effective and cost-effective in randomized trials for improving depression.^{1,4,5} Implementing and sustaining these interventions in real-world settings, however, has presented significant challenges.^{12,19,20,30,32} In randomized trials,

investigators are highly motivated to achieve strong results, creating “ideal” circumstances with highly trained staff who are closely supervised by expert clinicians and protocols that maximize treatment adherence. This is not the case for program implementation in real-world clinical settings, so there is often incomplete fidelity to the trial-tested model and significant variation across sites. Implementation can be constrained by current practice patterns, staff availability, competing demands, and financial concerns, which can lead to program results that don’t match those of the carefully constructed clinical trials. Thus, understanding which elements of the care model are of greatest importance may be essential for spread and generalizability.

These results highlight essential elements of implementation for collaborative care of depression, and provide useful guidance for clinics or healthcare systems considering adoption of the model. This is particularly critical as organizations consider where to focus their limited resources and attention, and attempt to answer the question: What is needed for effective implementation of collaborative care for depression?

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■ eAppendix. Site Visit Discussion Guide

1. What is the extent to which the ICSI collaborative helped in your organization's building of infrastructure, culture, and ease of adoption of the model?
2. How challenging was the culture/practice change needed to implement a functional collaborative team in your clinic(s)?
3. Where do you most find you have to invest your energy in regard to this program?
4. How well does the team approach work in your clinic(s)?
 - a. What works well? Give examples if possible.
 - b. What could be improved? Give examples if possible.
 - c. PCP referrals – are all PCPs referring? What are the challenges and how can we help?
5. Care manager role:
 - a. What kind of person is best suited for DIAMOND?
 - b. What do they need to be most effective?
 - c. Most challenging/satisfying aspects of work as CM.
6. Other types of jobs that the CM is doing.
7. How much do you deal with medical, psychiatric, substance abuse, social, or other complexities with the DIAMOND patients?
8. How do you use your consulting psychiatrist?
 - a. What works well?
 - b. What could be improved?
9. Mental health resources/tracking/communications use/referral for Problem Solving Therapy (PST), experience with accessing other mental health services (counseling, psychotherapy, other mental health / substance abuse services), patients seeing a therapist or other MH, coordinating care with other or outside mental health providers.
10. Use of registry.
11. If you have spread DIAMOND to other clinics, what was your spread model or approach?
 - a. How successful was it – what went well?
 - b. What would you do differently if you had to do it again?
 - c. What was the ICSI training experience for the spread groups vs the initial group?
12. Could you see yourself extending the DIAMOND model to other populations in your clinic (eg, different ages, other mental or medical problems) and if so, how would you go about this?
13. What was the impact of having no startup money provided? How did your organization cover that and why did they commit to it?
14. What are the payment challenges yet to overcome? Do you have any ideas/solutions? How long could you sustain this model in its current form?
15. What would it take to make DIAMOND a routine part of care for your organization? Operational vs cultural issues?
16. What do you feel you have to invest in order to fully integrate and make the most of DIAMOND in your practice - in terms of knowledge, effort, commitment?
 - a. Relationships/interactions
 - b. Design of systems
 - c. Other