ORIGINAL ARTICLE

Incremental Benefit and Cost of Telephone Care Management and Telephone Psychotherapy for Depression in Primary Care

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Context: Effectiveness of organized depression care programs is well established, but dissemination will depend on the balance of benefits and costs.

Objectives: To estimate the incremental benefit, incremental cost, and net benefit of 2 depression care programs.

Design: Randomized trial comparing 2 interventions with continued usual care, conducted between November 2000 and June 2004.

Setting: Seven primary care clinics of a prepaid health care plan in Washington.

Participants: Consecutive primary care patients starting antidepressant treatment were invited to a telephone assessment 2 weeks later. Of 634 patients with significant depressive symptoms, 600 consented and were randomized.

Interventions: The telephone care management intervention included up to 5 outreach calls for monitoring and support, feedback to treating physicians, and care coordination. The care management plus telephone psychotherapy intervention added an 8-session structured cognitive behavioral therapy program with up to 4 additional calls for reinforcement.

Main Outcome Measures: Independent, blinded telephone assessments at 1, 3, 6, 9, 12, and 18 months included the Symptom Checklist 90 depression scale. Health services costs were measured using health care plan accounting records.

Results: Over 24 months, telephone care management led to a gain of 29 depression-free days (95% confidence interval, −6 to +63) and a $676 increase in outpatient health care costs (95% confidence interval, $596 lower to $1974 higher). The incremental net benefit was negative even if a day free of depression was valued up to $20. Care management plus psychotherapy led to a gain of 46 depression-free days (95% confidence interval, +12 to +80) and a $397 increase in outpatient costs (95% confidence interval, $882 lower to $1725 higher). The incremental net benefit was positive if a day free of depression was valued at $9 or greater.

Conclusion: Compared with current primary care practice, a structured telephone program including care management and cognitive behavioral psychotherapy has significant clinical benefit with only a modest increase in health services cost.

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Over the last 15 years, numerous randomized trials have demonstrated the effectiveness of organized treatment programs for depression in primary care.[1,2] While these programs differ in details, core principles include collaboration between mental health and primary care clinicians, systematic application of evidence-based guidelines, active monitoring of treatment adherence and outcomes, and organized outreach and education to improve adherence (for both medications and psychotherapy). These interventions have proven effective across a wide range of patient populations and health care systems.[3-8]

Broad implementation of improved depression care programs will depend on the balance of benefits and added costs. Depression has large economic effects outside the health care system, including disability, lost work productivity, reduced educational attainment, and relationship disruption.[9-14] Ideally, decisions about the value of depression care programs should consider these broader economic effects.[15] In the short run, however, decisions by health care insurers and publicly funded health care programs will likely focus on the narrower perspective of costs and savings in the health care system.

A first wave of cost-effectiveness studies indicated that organized programs to

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improve care for depression led to moderate increases in overall health care costs.[16-21] Over 6 to 12 months, added costs ranged from approximately $150 for low-intensity telephone care management programs[19] to $600 or more for more intensive interventions including structured medication management and/or psychotherapy.[16,18,20] In general, clinical benefits were proportional to intervention intensity and incremental cost. Over 6 to 12 months, the added cost per additional day free of depression was typically $15 to $25.[16,18,20]

Subsequent studies have suggested a more favorable balance of costs and benefits.[22-24] More favorable findings in recent studies probably reflect 2 differences in methods. First, more recent interventions make extensive use of less expensive care managers, reserving specialty consultation for patients with more complex or treatment-resistant illness. These targeted or stepped-care programs may improve quality of treatment at a lower average cost. Second, follow-up periods of 2 years or longer can detect the longer-term benefits of a short-term investment in improved depression care. Added costs of improved depression treatment concentrate in the first months of treatment, while clinical and economic benefits may continue to accumulate for many months longer.

We describe here the long-term cost and effectiveness of 2 systematic care programs for primary care patients beginning antidepressant treatment. One program provided telephone care management to improve quality and continuity of antidepressant treatment. The other included telephone care management plus a structured cognitive behavioral psychotherapy program by telephone. As previously published,[25,26] the care management plus psychotherapy program yielded significant and sustained improvements in depression, while the care management program had less benefit.

This study makes 2 significant contributions to research on the cost-effectiveness of organized care programs for depression. First, it directly compares usual primary care with 2 levels of intervention: a less expensive program of brief contacts with bachelors-level clinicians and a more expensive program delivered by masters-level clinicians. The distinctions between these programs in both cost and availability of personnel have important practical implications. Second, this study directly compares usual care with an intervention focused on improving the quality of medication management and an intervention including both medication management and structured psychotherapy.

METHODS

Study methods are described in detail in earlier articles[25-27] and will be summarized here.

Participants were recruited between November 2000 and May 2002 at 7 primary care clinics of Group Health Cooperative, a prepaid health care plan serving approximately 500 000 members in Washington and northern Idaho. Group Health Cooperative membership is generally representative of the area population and includes Medicare beneficiaries and low-income members enrolled through Medicaid and the Washington Basic Health Plan.

Computerized pharmacy and visit registration records were used to identify patients receiving new antidepressant prescriptions from primary care physicians and to exclude those already receiving psychotherapy or other specialty mental health care. Potential participants were contacted by an invitation letter followed by a telephone call. The telephone baseline interview assessed demographic characteristics (marital status, educational attainment, employment status, and self-reported race and ethnicity) as well as depression severity measured by a 20-item scale extracted from the Symptom Checklist 90 (SCL-90).[28] Those with SCL-90 depression scores of 0.5 or greater were invited to enroll in a randomized trial evaluating 2 telephone support programs for people starting antidepressant treatment. Consenting participants were randomly assigned to 1 of 3 groups: continued usual care, telephone care management, or telephone care management plus psychotherapy.

Participants assigned to the usual care control group continued to receive any treatment normally available, including follow-up visits in primary care and subsequent referral to specialty mental health care.

Participants assigned to the telephone care management group received up to 5 brief telephone calls or personalized mailings intended to monitor and improve antidepressant adherence and to support follow-up in primary care. Telephone contacts were scheduled approximately 4, 8, and 16 weeks after the initial prescription. Two additional mail contacts were scheduled approximately 26 and 36 weeks after the initial prescription. Each call or mailing included a structured assessment of depression symptoms, antidepressant use, and medication adverse effects. During telephone contacts, care managers followed specific scripts to support medication adherence and to address common adverse effects or other reasons for discontinuing medication. Following each call or mailing, the care manager provided structured written feedback to the treating primary care physician including algorithm-based recommendations regarding the need for medication adjustment or specialty consultation. As needed, care managers facilitated follow-up visits in primary care or referral to specialty care. Care managers were bachelors-trained clinicians (Kenneth Haverkamp, BA, and Sarah Heath, BA [who has since obtained an MA]) with prior experience in telephone assessment.[19] Care managers received approximately 4 hours of additional training for this project and approximately 30 minutes of supervision each week. Each participant in this group received a copy of a self-management workbook,[29] but care managers did not provide any specific psychotherapy. Telephone contacts lasted a mean of 13 minutes, but significant additional time was spent in outreach and unsuccessful contact attempts.

Participants assigned to the care management plus psychotherapy group received up to 12 calls, including both care management and a structured cognitive behavioral psychotherapy program delivered by telephone. Initial telephone contacts were scheduled approximately 4, 5, 6, and 8 weeks after the initial prescription with the timing of subsequent sessions depending on clinical need and patient preference. Each session included all elements of the care management program described earlier. Sessions 1 through 8 followed a structured program for acute-phase cognitive behavioral psychotherapy for depression (1 session of psychoeducation regarding depression and depression treatment, 3 sessions focused on behavioral activation, 3 sessions focused on identifying and challenging recurrent negative thoughts, and 1 session focused on developing a long-term self-care plan). Subsequent booster sessions focused on adhering to and/or refining the self-care plan. Adherence to the protocol was supported by a detailed participant workbook,[29] therapist agendas for each session, and detailed fidelity checklists. Therapists were masters-level clinicians (Kristin Lunte, MA, and Steve Tutty, MA [who has since

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obtained a PhD]) with at least 1 year of experience in outpatient psychotherapy for depression. Training for this project included 12 hours of didactic instruction and role play, trainee's observation of at least 6 sessions, and conduct of 6 sessions with audiotape observation. The 2 therapists received 60 minutes of supervision each week from a psychologist (E.J.L.) and a psychiatrist (G.E.S.). Each therapist audiotaped approximately 15 additional sessions for review of competence and protocol adherence. Calls for the initial 8 sessions lasted a mean of 31 minutes, and booster calls lasted a mean of 18 minutes. Significant additional time was spent in outreach and unsuccessful contact attempts.

Participants assigned to the 3 treatment groups were contacted for independent, blinded telephone outcome assessments scheduled 1, 3, 6, 9, 12, 15, and 18 months after study enrollment. Each assessment included repeat administration of the SCL-90 depression scale as well as other measures not described here.

The invitation letter and baseline telephone script included all elements of informed consent (purpose of the study, description of procedures and potential risks, voluntary nature of participation, and procedures for protecting confidentiality). All participants provided documented oral consent prior to the baseline assessment and again prior to enrollment in the randomized trial. The Group Health Cooperative institutional review board approved all study procedures, including the use of a documented oral consent procedure in lieu of a written form.

Analyses of incremental benefit and incremental cost considered a 24-month period following randomization to facilitate comparison with other recent effectiveness trials of depression care management programs.[22-24] Those trials suggest that shorter evaluation periods may overestimate incremental cost of improved depression treatment and underestimate benefit.

Effectiveness of each treatment was summarized by the number of depression-free days over 24 months using the method originally developed by Lave and colleagues[16] and adapted by us for the SCL-90 depression scale.[20,21,24] For each assessment, an SCL depression scale score less than 0.7 was considered depression-free, a score of 1.5 was considered fully symptomatic, and scores in between were assigned a proportional value. Sensitivity analyses using alternative thresholds for depression-free and fully symptomatic had only minimal effect on our estimates of differences between treatment groups. These calculations assumed that all intervention benefit disappeared by 24 months.

Costs for all health services provided or paid for by Group Health Cooperative were calculated using the health care plan's computerized accounting records.[30] For services provided by Group Health Cooperative, these records reflect general ledger costs for each service unit (clinic, pharmacy, etc) with all administrative costs allocated to service units on a proportional basis. For external services paid for by Group Health Cooperative, these records reflect actual reimbursement rather than charges.

Costs for intervention services (telephone contacts, supervision, administrative support, facilities, and overhead) were calculated using personnel time, salary and fringe benefit rates, and a support/facilities/overhead rate of 30%. We estimated 0.8 hour for each completed care management contact and 1.2 hours for each completed telephone psychotherapy session, estimates consistent with a formal time allocation study of a similar care management program.[31] Fixed costs for training, supervision, and infrastructure were equally allocated across all participants assigned to each intervention program.

Incremental cost for each of the intervention programs compared with usual care was calculated for 3 categories of cost. Depression treatment costs included any costs of the intervention program plus health care plan costs directly related to depression treatment (antidepressant prescriptions, specialty mental health care visits, and primary care visits associated with a depression diagnosis). Total outpatient costs included depression treatment costs plus health care plan costs for all other outpatient services. Total costs included depression treatment costs plus health care plan costs for all other health services (outpatient and inpatient). All costs are presented in 2004 US dollars.

Our hypotheses focused on outpatient costs. The sample size was not sufficient to support accurate comparisons of inpatient health services costs, so those are presented as secondary analyses only. Complete cost data were available only for participants remaining enrolled in the Group Health Cooperative health care plan.

All analyses were based on original assignment regardless of treatment received. Primary analyses included only participants with complete data (ie, those who completed the 18-month follow-up assessment for calculation of effectiveness and remained enrolled in the health care plan for 24 months for calculation of cost). Sensitivity analyses included participants with partial data. Inclusion of participants with partial cost data yielded lower estimates of total costs but did not affect estimates of cost differences between treatment groups.

Estimated incremental cost was adjusted for age, sex, and outpatient costs during the 6 months prior to baseline. Estimated gain in depression-free days was adjusted for age, sex, and baseline depression scale score. Given the skewed distribution of cost data, analyses were conducted using γ regression with a log link. This method allows us to assess the sensitivity of the linear model to skewness in cost outcomes and should provide less biased estimates of mean differences than would comparison of log-transformed costs.[32]

Value of the intervention program was assessed using incremental cost, incremental benefit, and incremental net benefit.[33,34] The net benefit approach combines both incremental cost and benefit into a single measure. Net benefit is equal to incremental benefit (incremental days free of depression multiplied by the dollar value assigned to each additional day) less incremental cost. Because net benefit is a sum rather than a ratio, this approach avoids some of the difficulties that may arise in computing the ratio of incremental cost to incremental effectiveness. For example, 2 identical negative cost-effectiveness ratios can have opposite meaning, implying that a new intervention is either clearly dominant (lower cost and higher benefit) or clearly inferior (higher cost and lower benefit) compared with standard care. In some cases, the confidence interval (CI) for a cost-effectiveness ratio can include both possibilities (ie, the CI extends from one negative number to another but actually includes all possible positive values as well). Because the dollar value of clinical benefit (in this case, days free of depression) is not clearly established, net benefit depends on the value assigned to an additional day free of depression.

RESULTS

The flow of study participants through recruitment, intervention delivery, and follow-up assessment is shown in **Figure 1**. Of those contacted, patients participating and not participating in the baseline assessment had similar age distribution, sex distribution, and rates of prior depression treatment. Baseline demographic and clinical characteristics of participants assigned to the 3 treatment groups are compared in **Table 1**. As shown in Figure 1, complete effectiveness data were available for

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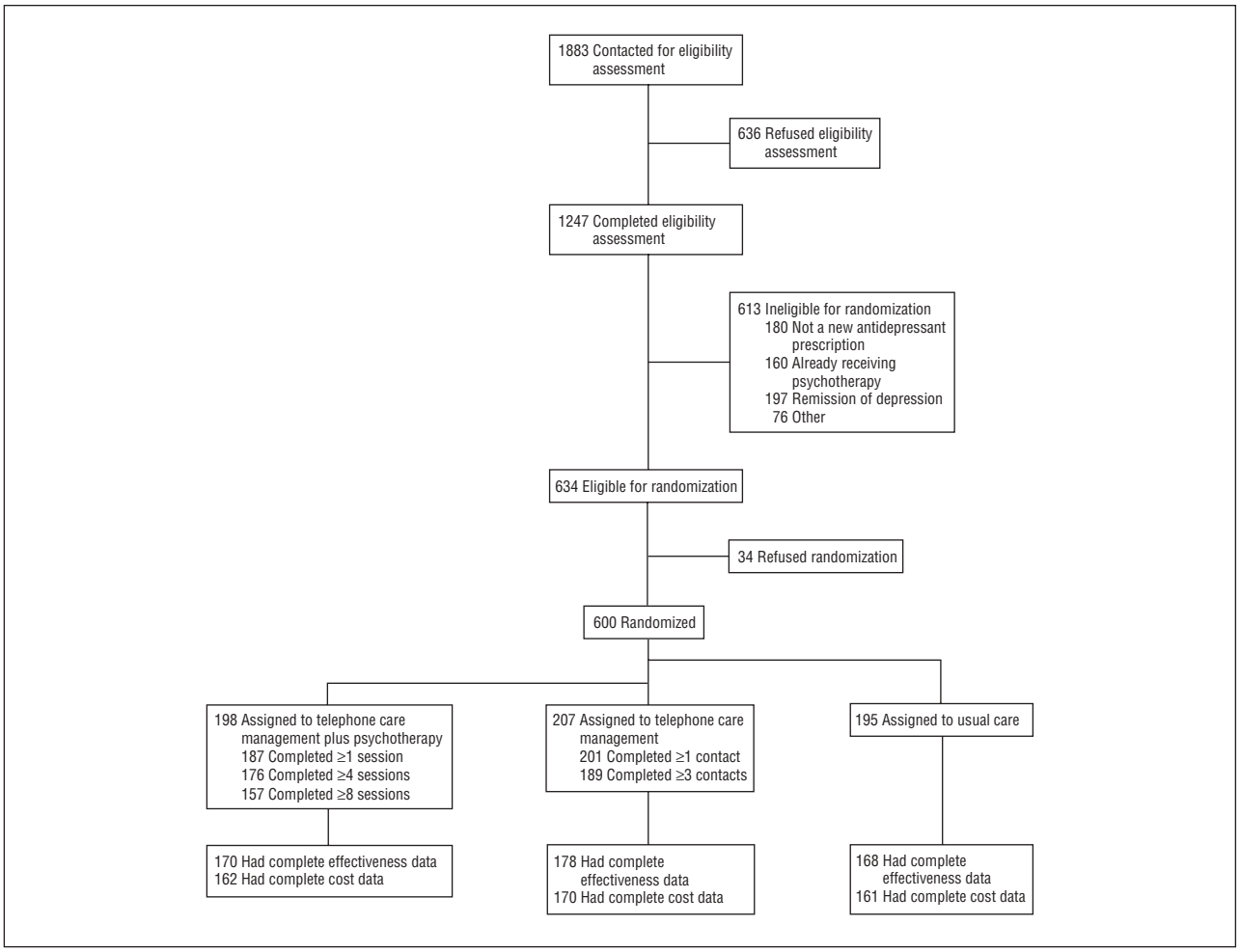

Figure 1. Study flowchart.

Table 1. Baseline Characteristics of Participants Enrolled in the Randomized Trial

Characteristic	Usual Care (n=195)	Telephone Care Management (n=207)	Telephone Care Management Plus Psychotherapy (n=198)	Test Statistic	*P* Value
Age, mean (SD), y	44.0 (16.0)	44.9 (15.3)	44.7 (15.7)	$F_2 = 0.20$	.82
Female, No. (%)	152 (78)	148 (72)	146 (74)	$\chi^2_2 = 2.25$	.32
Married or cohabiting, No. (%)	99 (51)	100 (51)	104 (50)	$\chi^2_2 = 0.01$	.99
College graduate, No. (%)	79 (40)	88 (42)	69 (35)	$\chi^2_2 = 2.69$	.26
Low-income insurance coverage, No. (%)[a]	24 (12)	24 (12)	27 (14)	$\chi^2_2 = 0.40$	.82
Non-Hispanic white, No. (%)	147 (75)	176 (85)	157 (79)	$\chi^2_2 = 5.93$	.05
SCL-90 depression scale score, mean (SD)	1.55 (0.62)	1.54 (0.61)	1.52 (0.58)	$F_2 = 0.24$	.79
Outpatient costs in prior 6 mo, mean (SD), $	1675 (1696)	1709 (2170)	1733 (2236)	$F_2 = 0.04$	.96

Abbreviation: SCL-90, Symptom Checklist 90.
[a] Includes Medicaid and a state-subsidized low-income insurance program.

86% of those randomized and complete cost data were available for 82%. Compared with participants with complete effectiveness data, those missing any assessment were less often college graduates (42% vs 23%, respectively; $\chi^2_1=10.94$; $P=.001$) and were less often married or cohabiting (52% vs 40%, respectively; $\chi^2_1=4.83$; $P=.03$). Those with and without complete effectiveness data did not differ significantly in treatment assignment, age, sex, race/ethnicity, baseline SCL-90 depression scale score, or outpatient costs for the 6 months prior to randomization. Compared with participants with complete cost data, those disenrolling from the health care plan before 24 months were younger (mean age, 46 vs 37 years, respectively; $t_{598}=5.7$; $P<.001$), were less often married or cohabiting (53% vs 42%, respectively; $\chi^2_1=4.95$; $P=.03$), and had higher baseline SCL-90 depression scale scores (1.50

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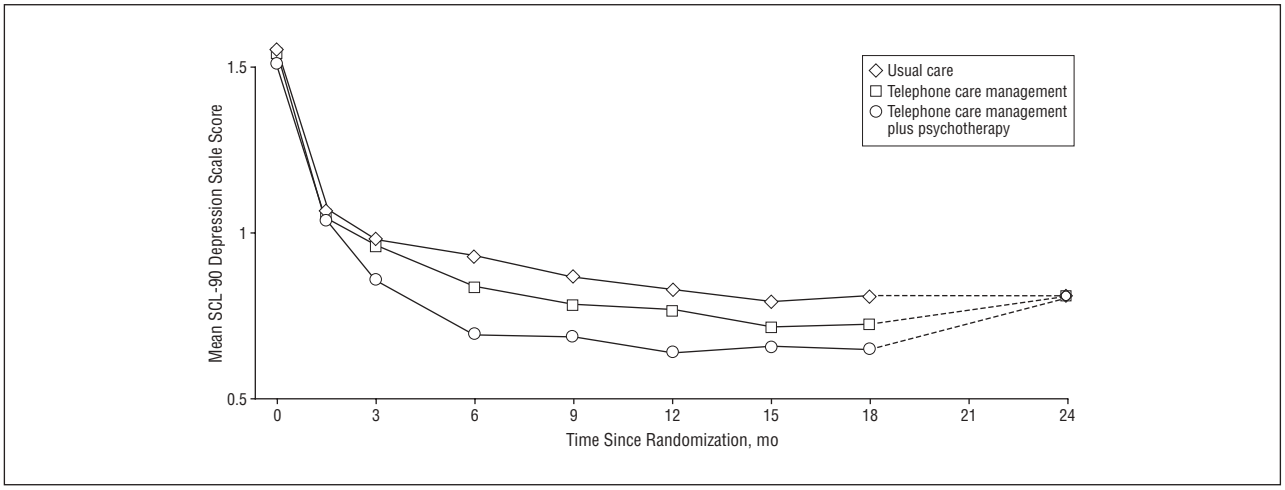

Figure 2. Symptom Checklist 90 (SCL-90) depression scale scores over time. No data were available past 18 months. We assume that both intervention groups regress to the usual care value by 24 months.

Table 2. Total Costs Over 24 Months, Limited to Those Enrolled Throughout

	Costs, Mean (SD), $[a]		
Cost Category	**Usual Care**	**Telephone Care Management**	**Telephone Care Management Plus Psychotherapy**
Intervention telephone contacts	NA	98 (11)	444 (144)
Specialty mental health care visits, medication management	40 (193)	91 (385)	53 (211)
Specialty mental health care visits, psychotherapy	154 (350)	226 (608)	98 (251)
Antidepressant prescriptions	394 (464)	530 (614)	498 (571)
Primary care visits, mental health diagnosis	432 (441)	540 (596)	577 (559)
Total depression treatment costs	**1020 (1009)**	**1485 (1258)**	**1670 (1110)**
Other outpatient costs	7284 (7226)	7241 (6544)	6778 (6333)
Total outpatient costs	**8304 (7526)**	**8726 (6980)**	**8448 (6751)**
Inpatient costs	1102 (4513)	1542 (5919)	886 (3214)
Total health care plan costs	**9406 (10 554)**	**10 268 (9773)**	**9334 (8432)**

Abbreviation: NA, not applicable.
[a] In 2004 US dollars.

vs 1.65, respectively; t_{598}=2.3; P=.02). Those with and without complete cost data did not differ significantly in treatment assignment, sex, race/ethnicity, educational attainment, or outpatient costs for the 6 months prior to randomization.

Mean SCL-90 depression scale scores for each time point are shown in **Figure 2**. As previously reported, depression scale scores at each follow-up assessment were lowest in those assigned to the telephone care management plus psychotherapy program, intermediate in those assigned to the telephone care management program, and highest in those assigned to continue care as usual. Figure 2 also illustrates our assumption that intervention benefit disappeared completely by 24 months. The number of depression-free days over 24 months can be calculated as the area under each curve in Figure 2, and the incremental benefit of each intervention program over usual care can be calculated as the area between the 2 corresponding curves. The adjusted gain in depression-free days compared with usual care was 29 days (95% CI, –6 to +63) for the telephone care management program and 46 days (95% CI, +12 to +80) for the telephone care management plus psychotherapy program.

Health services costs over 24 months for each group are shown in **Table 2**. Compared with the usual care control group, depression treatment costs were approximately $450 higher in the telephone care management group and approximately $650 higher in the telephone care management plus psychotherapy group (reflecting direct costs of the telephone intervention program as well as associated costs for antidepressant prescriptions and outpatient visits for depression care). Other outpatient costs appeared lower in the telephone care management plus psychotherapy group, but this category of costs showed much greater variability. Compared with the usual care control group, total outpatient costs appeared slightly higher in the telephone care management plus psychotherapy group and moderately higher in the telephone care management group. In a γ regression model including adjustment for age, sex, and costs for the 6 months prior to randomization, total outpatient costs were $676 higher (95% CI, $596 lower to $1974 higher) for the telephone care management program than for the usual care group. In the same model, adjusted outpatient costs were

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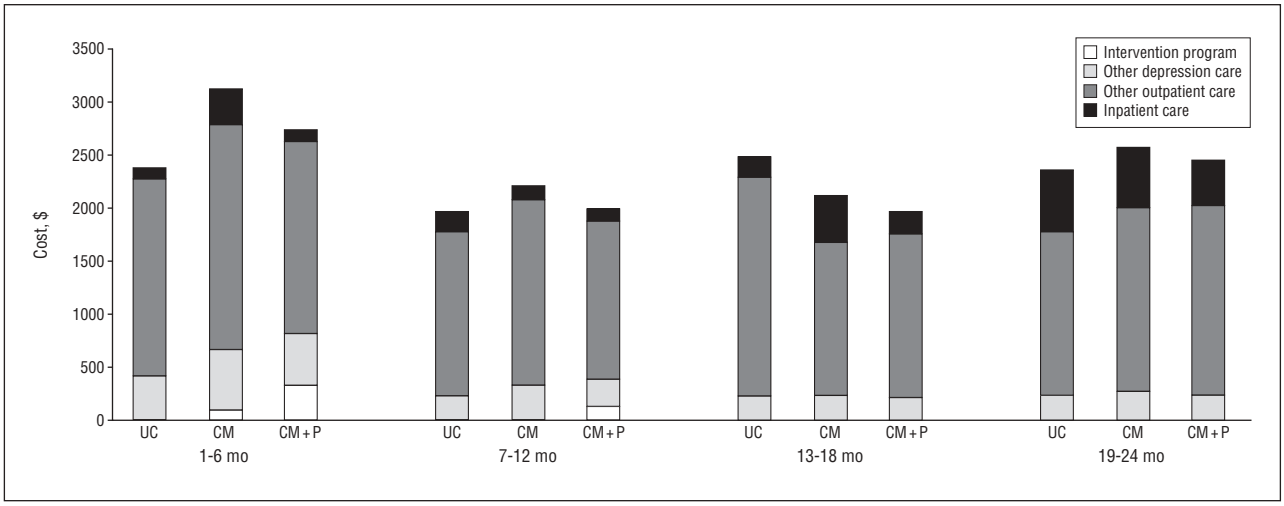

Figure 3. Comparison of cost categories over time. UC indicates usual care; CM, telephone care management; and CM + P, telephone care management plus psychotherapy.

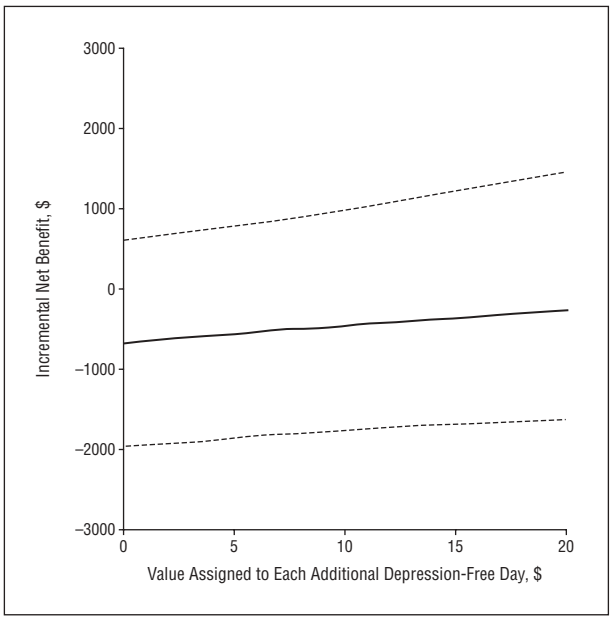

Figure 4. Incremental net benefit (benefit minus added cost) of the telephone care management program compared with usual care. The net benefit of the program varies according to the value assigned to each additional day free of depression. Dashed lines indicate 95% confidence interval.

$397 higher (95% CI, $882 lower to $1725 higher) in the telephone care management plus psychotherapy group compared with the usual care group. Inpatient costs showed much greater variability, and no statistical comparisons were performed for either inpatient costs or total health services costs.

Figure 3 illustrates how specific categories of health care cost varied across the 3 groups over time. Added costs of the intervention programs were greatest in the first 6 months, relatively small in the second 6 months, and (by design) absent after 12 months. Other depression care costs showed a similar pattern in all 3 groups: greatest in the first 6 months and gradually decreasing over time. Outpatient medical costs and inpatient costs fluctuated over time, but these categories were more variable (Table 2). During any 6-month period, cost differences in these categories were well within variation expected by chance.

The net benefit of each intervention program is calculated as the value of added depression-free days minus added outpatient cost. **Figure 4** illustrates how the incremental net benefit for the telephone care management program varies according to the value assigned to an additional day free of depression. When an additional day free of depression is valued at $0, the net benefit of the program is equal to the added cost, approximately $675 over 24 months. As value assigned to an additional day free of depression increases, the net benefit becomes less negative (ie, net cost decreases). However, the net benefit remains negative even if an additional day free of depression is valued at $20 (ie, 29 added days free of depression times $20 per day does not balance an added cost of $675). Given the wide CIs, though, we cannot exclude the possibility of a positive benefit (benefit greater than cost) for any value we assign to a day free of depression. We also cannot exclude a net cost of $1500 or more.

Figure 5 illustrates how the incremental net benefit of the telephone care management plus psychotherapy program varies according to the value assigned to an additional day free of depression. The slope of the incremental net benefit line is steeper than that in Figure 4, reflecting the greater gain in depression-free days with telephone care management plus psychotherapy. We estimate that the incremental net benefit becomes positive (ie, the value of added days free of depression exceeds added cost) whenever the value we assign to an additional depression-free day exceeds approximately $9. Once again, the CIs for these estimates are wide. The 95% upper bound of net benefit ranges from a gain of approximately $900 (if we attach no value to a day free of depression) to a gain as high as $2000 (if a day free of depression is given a value of $20). Conversely, the 95% lower bound of net benefit ranges from an added cost of $1000 (if a day free of depression is valued at $20) to an

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added cost as high as $1700 (if a day free of depression is valued at $0).

COMMENT

We observed that both intervention programs yielded long-term clinical benefit compared with usual primary care, but this benefit was larger for the program including structured telephone psychotherapy. Both programs increased spending on depression treatment, and this increase was again larger for the care management plus psychotherapy program than for care management alone. Both programs led to modest increases in outpatient health care costs over 2 years. We estimate that this added cost was actually smaller for the telephone care management plus psychotherapy program than for the care management program, but the CIs around these estimates were wide.

The incremental net benefit of improved depression treatment reflects the balance of clinical benefits and added costs. For the telephone care management plus psychotherapy program, the balance between these two occurs when we attach a value of $9 for an additional day free of depression (ie, added cost of approximately $400 is balanced by benefit of approximately 46 additional days free of depression). Whenever we attach a value of more than $9 per day to an additional day free of depression, the added costs of the telephone care management plus psychotherapy program would be more than outweighed by long-term benefits. The economic value of an additional day free of depression is not clearly established, and that value almost certainly varies between decision makers and between situations. Potential economic benefits of more effective depression treatment vary across different demographic groups and might include increased educational attainment, increased work productivity, and reduced expenditures for disability payments.[9-14] Our study did not include direct measures of these economic effects. Previous research suggests that improvement in depression does lead to increased work productivity,[35,36] but this benefit is confined to those working for pay. Willingness to pay for time free of depression is a simple (albeit far from perfect) method for summarizing various economic benefits of improved depression care. Our previous research suggests that primary care patients treated for depression are on average willing to pay approximately $10 (in 2000 US dollars) for an additional day free of depression.[37]

These findings are generally consistent with other recent research regarding the incremental benefits and costs of improving depression treatment in primary care. As in other studies, clinical benefits of the interventions continued for at least several months beyond the duration of the intervention program.[3,4,24] Direct costs of the care management intervention program were similar to those for other low-intensity interventions,[19,31] and direct costs of the care management plus psychotherapy program were consistent with those of other more intensive interventions.[18,23,24] As in other studies, added costs of the intervention programs appeared to be at least partially offset by decreased use of other outpatient medical services.

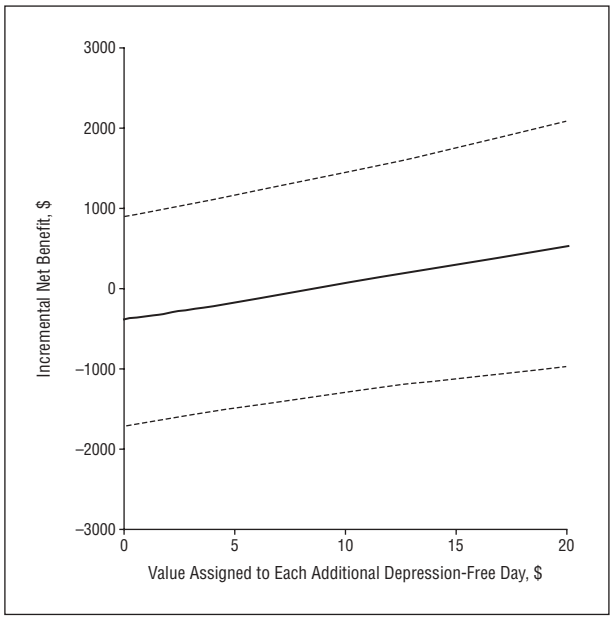

Figure 5. Incremental net benefit (benefit minus added cost) of the telephone care management plus psychotherapy program compared with usual care. The net benefit of the program varies according to the value assigned to each additional day free of depression. Dashed lines indicate 95% confidence interval.

Our calculations do ignore costs and benefits beyond 2 years, and that strategy is likely to underestimate the net benefit of the 2 intervention programs. We assume that clinical benefit of the intervention completely disappeared by 24 months. In addition, we excluded any sustained reduction in use of medical services that might result from the intervention programs. Long-term data from previous trials of organized depression care programs indicate both that clinical benefits may continue for considerably longer and that patients receiving more effective depression treatment may have lower general medical costs over the next 5 years.[38-40]

In comparison with previous studies, these findings more directly address the added benefits and costs of treating depression with medications and structured psychotherapy as opposed to medication alone. The care management program focused on improving the quality and continuity of antidepressant medication treatment. Compared with usual care, this program led to modest increases in both clinical benefits and outpatient health services costs. Considered from the narrow health care plan perspective, benefits of the program did not outweigh added costs even if we valued an additional day free of depression at $20 or more. The care management plus psychotherapy intervention added a structured cognitive behavioral psychotherapy program adapted to serve those not reached by traditional psychotherapy. In comparison with the care management intervention alone, adding psychotherapy led to sustained improvements in clinical outcomes with no increase in overall health care costs.

We should caution that our sample does not allow enough statistical power to either detect or exclude small differences in cost. While we estimate that total health care costs were approximately $400 higher in the care management plus psychotherapy group than in the usual

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care group, we cannot exclude a cost increase as large as $1700 or a cost savings as large as $900. Consistency of our findings with those from several previous trials, however, increases our confidence in the overall results.

Interpretation of these findings should consider some other limitations. A significant portion of participants was lost to follow-up over 2 years. It is possible that the balance of benefits and costs was quite different among those lost to follow-up, but we see only minor differences between this group and the main sample at baseline. The study was conducted in a single group-model prepaid health care system. As we discussed earlier, however, findings regarding both clinical benefits and added costs are generally consistent with those seen in other settings.[22,23] Most enrolled patients were non-Hispanic white, and most were covered by commercial or individually purchased health care insurance. Previous research suggests that benefits of organized care programs for depression may be greater among members of racial or ethnic minorities[41] and the uninsured.[42] Our analyses do not consider the broader effects of depression or depression treatment on other economic outcomes such as work productivity or family burden. Given the clinical benefits of the intervention, we would expect that measurement of these broader effects would lead to more positive estimates of the net benefit.

Our findings may have different implications for health care systems in which specialty mental health care and/or prescription drug costs are carved out of overall health care spending. This is best illustrated by the 2-year totals in Table 2. For an integrated health care system, unadjusted outpatient costs were approximately $150 higher for the care management plus psychotherapy group than for the usual care control group. However, this increase is not evenly spread across different components of depression treatment. In the care management plus psychotherapy group, specialty mental health care costs were approximately $50 higher and antidepressant prescription drug costs were approximately $100 lower than in the usual care group. If specialty mental health care costs were carved out from the total, the difference between the care management plus psychotherapy group and the usual care group would increase to approximately $200. On the other hand, exclusion of prescription drug costs would lead to a more favorable result, reducing the incremental cost of the care management plus psychotherapy program to only $50. While this sample is not large enough to precisely resolve these small differences, findings in this study are generally consistent with previous trials[19,20,23,24]: organized depression care programs generally increase spending on antidepressant drugs and may decrease spending on specialty mental health care.

The primary goal of depression treatment is to relieve suffering and improve function, not to decrease health care costs. We certainly do not intend to imply that depression treatment is justified only if it is either cost neutral or cost saving. Our findings do, however, offer some guidance to insurers or health care systems considering efforts to improve care for depression. When compared with current practice, a telephone care management program yields modest improvements in clinical outcomes and moderate increases in overall costs. In this study, the balance of added benefits and added costs was certainly not compelling. In contrast, a program of telephone care management plus structured telephone psychotherapy yielded significant and sustained benefits and modest increases in overall costs. The balance of added benefits and added costs was more favorable for the more intensive program. Efforts to improve depression treatment in primary care should consider incorporating structured psychotherapy interventions.

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