Cost-effectiveness of a Primary Care Depression Intervention

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OBJECTIVE: To determine the incremental cost-effectiveness of a quality improvement depression intervention (enhanced care) in primary care settings relative to usual care.

DESIGN: Following stratification, we randomized 12 primary care practices to enhanced or usual care conditions and followed patients for 12 months.

SETTING: Primary care practices located in 10 states across the United States.

PATIENTS/PARTICIPANTS: Two hundred eleven patients beginning a new treatment episode for major depression.

INTERVENTIONS: Training the primary care team to assess, educate, and monitor depressed patients during the acute and continuation stages of their depression treatment episode over 1 year.

MEASUREMENTS AND MAIN RESULTS: Cost-effectiveness was measured by calculating incremental (enhanced minus usual care) costs and quality-adjusted life years (QALYs) derived from SF-36 data. The mean incremental cost-effectiveness ratio in the main analysis was $15,463 per QALY. The mean incremental cost-effectiveness ratios for the sensitivity analyses ranged from $11,341 (using geographic block variables to control for pre-intervention service utilization) to $19,976 (increasing the cost estimates by 50%) per QALY.

CONCLUSIONS: This quality improvement depression intervention was cost-effective relative to usual care compared to cost-effectiveness ratios for common primary care interventions and commonly cited cost-effectiveness ratio thresholds for intervention implementation.

KEY WORDS: cost-benefit analysis; depression; quality of life; primary health care.

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With major depression projected to constitute an increasing share of the global burden of disease, there have been concerted efforts worldwide to develop more effective depression management strategies. In the United States, efforts to improve depression management have focused on the primary care setting, where a wide diversity of “best practice models” to diagnose and manage depression have been tested. Incremental cost-effectiveness analyses provide a useful framework for comparing a wide variety of best practice models.

Interventions that integrate mental health professionals into the primary care setting have demonstrated remission rates similar to those in specialty care efficacy studies. However, widespread dissemination of integrated interventions is unlikely, because the majority of primary care clinics do not employ on-site mental health professionals. The quality improvement intervention tested in this study attempted to fill this gap by training primary care professionals to more effectively identify and treat depression. In particular, the intervention trained office nurses to supplement the primary care physician’s efforts to provide antidepressant medication treatment or referral to mental health counseling. The development of the intervention is presented in more detail elsewhere.

In a prospective study, we evaluated the incremental cost-effectiveness of this brief quality improvement intervention for primary care patients beginning a new treatment episode for major depression relative to usual care. We compared the quality-adjusted life years (QALYs) of patients in practices who received the intervention (enhanced care) to patients in practices who did not (usual care). We estimated costs from a societal perspective by calculating the costs of the intervention, health care utilization, patient time, and transportation. We hypothesized that over a 12-month period of time, the brief intervention would be cost-effective compared to the cost-effectiveness (CE) ratios of common primary care interventions and commonly cited CE ratio thresholds for intervention implementation.

METHODS

Design

We used a randomized block design described previously to compare outcome differences between enhanced and usual care. A 2-stage stratification plan was used to randomly assign practices to enhanced or usual care. The first stage divided 12 practices identified by numerical code into metropolitan versus nonmetropolitan location in order
to identify primary care sites with more (metropolitan) or less (nonmetropolitan) access to off-site mental health specialty care. The second stage paired 8 metropolitan practices and 4 nonmetropolitan practices based on the participating physicians’ baseline (i.e., pre-intervention) proclivity to treat depressed patients in accordance with Agency for Healthcare Research and Quality (AHRQ) depression treatment guideline recommendations.\textsuperscript{19,20} Baseline physician concordance with AHRQ treatment guidelines (concordance defined as patient on guideline-recommended dose of antidepressant medication and/or in specialty care counseling) was determined by reviewing treatment logs completed by each participating physician for 20 consecutive depressed patients.\textsuperscript{18} One practice from each of the 6 pairs was then randomly selected to participate in the enhanced care intervention and the other practice provided usual care.

**Intervention**

Primary care teams assigned to the enhanced care condition completed the intervention training before subject recruitment began. Physicians and nurses completed a series of 4 academic detailing telephone calls over a 2-month period, the goal of which was to systematically engage providers with the content of Agency for Health Care Policy and Research Guidelines.\textsuperscript{20,21} The intervention presented pharmacotherapy and psychotherapy as equally efficacious treatments.\textsuperscript{18} The nurses completed an additional 8-hour face-to-face training session, conducted by the research team, designed to teach them to assess, educate, and monitor depressed patients during the acute and continuation stages of their depression episode.\textsuperscript{18} Administrative staff in both enhanced and usual care practices completed an 8-hour training session on recruiting eligible patients using a 2-stage screening process.

At the initial visit, the nurse assessed depression symptoms, provided information to the patient about his/her preferred treatment, asked patients to complete an individualized assignment to increase or maintain their readiness to engage in active treatment, and arranged a time to talk with the patient during the next week. This material was summarized and documented on a short checklist attached to the front of the patient’s chart prior to the physician visit. The nurses used a similar protocol to conduct 15-minute telephone or in-person follow-up discussions with patients during the next 5 to 7 weeks, averaging a total of 5.2 (SD = 1.9) contacts with each patient participating in the acute treatment stage. The continuation stage intervention was implemented on average 9 months after subjects’ index visits to facilitate the re-initiation or adjustment of treatment in patients who were symptomatic (i.e., reporting 3 or more depression symptoms) at that time point. Patient components of the continuation intervention included periodic symptom/treatment monitoring by nurse care managers, who also encouraged patients to participate in active treatment. Physician components of the continuation intervention included reviewing monthly patient symptom/treatment summaries and recommendations for treatment re-initiation/adjustment (see Appendix at www.blackwellpublishing.com/jgl).\textsuperscript{22} Nurses completed an average of 4.0 (SD = 2.9) symptom/treatment monitoring contacts among patients participating in the continuation intervention prior to 12-month follow-up. Physicians in usual care practices were not informed about which patients were participating in the study, nor did their nurses receive the enhanced care training or contact depressed subjects on a regular basis. All primary care professionals were salaried employees of the practice, not the study; however, the time they spent providing the intervention was factored into the intervention costs as described below.

**Sites**

The 12 primary care practices were located in 10 states across the country. Each practice was a member of 1 of 3 practice research networks, had 2 primary care physicians (family physicians or internists) willing to participate in the study, an office nurse willing to deliver the nursing intervention as detailed in the protocol if the practice was randomized to the enhanced care condition, and practice coordinators (administrative staff) willing to screen patients for major depression as part of usual care; none of the practices engaged an on-site mental health professional to provide depression treatment.

**Subjects**

Subject recruitment, described at length elsewhere,\textsuperscript{18} included a 2-stage screening process in 1996–1997 to identify a representative group of primary care patients beginning a new treatment episode for major depression, as defined in the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV), before they saw the participating physician for the index visit (Fig. 1).

Patients were eligible for this analysis if they: i) reported 5 or more of the 9 criteria for major depression in the past 2 weeks using the Inventory to Diagnose Depression\textsuperscript{23}; ii) screened negative for lifetime mania; iii) screened negative for lifetime alcohol dependence with current drinking; iv) did not meet DSM-IV criteria for bereavement-related depression; v) reported no antidepressant medication in the last month and no specialty mental health care in the last 6 months; and (vi) had sufficient SF-36 data at baseline, 6, and 12 months to calculate SF-36 quality-adjusted index scores. The sixth eligibility criterion eliminated 5 otherwise eligible subjects from this study. In virtually all cases, both screening and enrollment were completed before the patient saw the physician for the index visit. Study enrollment procedures, including management of suicidal intent, were approved by the Human Research Advisory