

Behavioral Medicine: The Challenge of Integrating Psychological and Behavioral Approaches into Primary Care

POLICY MATTERS

PETER C. TRASK, PhD

STEVEN M. SCHWARTZ, PhD

STEPHANIE L. DEANER, PhD

AMBER G. PATERSON, PhD

Behavioral Medicine Program

TIM JOHNSON, MD

Department of Dermatology,

Otorhinolaryngology, and Surgery

MELVYN RUBENFIRE, MD

Department of Internal Medicine

OVIDE F. POMERLEAU, PhD

Behavioral Medicine Program

University of Michigan

Ann Arbor, Mich

Eff Clin Pract. 2002;5:75-83.

The effects of psychological and behavioral factors on physical illness are increasingly recognized. For example, depression and anger have repeatedly been reported as key predictors of a poor recovery following myocardial infarction, independent of specific disease indices.¹⁻³ Depression, anticipatory nausea, and anxiety are often common in cancer patients.⁴⁻⁸ Depression and anxiety have also been associated with greater levels of physical disability, diminished quality of life, and increased health care utilization.⁹ In fact, psychological and behavioral factors are relevant to some of the most common chronic illnesses (e.g., cancer, chronic pain, cardiovascular disease, Crohn disease, diabetes, asthma/chronic obstructive pulmonary disease). With increased recognition of and empirical support for the contribution of psychological and behavioral variables in the development, maintenance, and/or exacerbation of disease comes the need for increased treatment options that incorporate not only the best of biomedical knowledge but also of biobehavioral science.

In this article, we present some thoughts on how “applied” behavioral medicine can be incorporated into health care, particularly primary care. To help readers understand behavioral medicine, we briefly review some of the evidence supporting behavioral medicine interventions for patients with cardiovascular disease and cancer. We then discuss how we have applied a conceptual model to implement behavioral medicine interventions into care at our own institution. Our goal is to encourage further dialogue on how to integrate behavioral medicine interventions into evidence-based health care.

A Brief History of Behavioral Medicine

Initially formulated as a reaction to psychoanalytic psychosomatic medicine and buttressed by the more empirically grounded behaviorist movement,¹⁰ behavioral medicine was developed in the 1970s to address psychobehavioral risk factors in health and disease.¹¹ At the time, the prevalent view of health and disease was biomedical, with a reductionistic focus on organs and organ systems. While the biomedical approach allowed for successful treatment of many acute conditions, it did little to address many chronic conditions in which lifestyle and behavioral factors played a crucial role.^{11,12} Thus, the limitations of a purely reductionistic approach to disease management gave impetus to a new perspective fostered by the publication of the “biopsychosocial” model of health and illness by Engel in 1977.¹³

As behavioral medicine expanded during the late 1970s to explore the interaction between behavior and illness more systematically, diverse and innovative behavioral medicine techniques were effectively applied to various medical populations. Two areas where research and clinical activity have been most active and fruitful are cardiovascular disease and cancer.¹⁴⁻⁴³ Research in these areas over the past 25

*Edited by Brenda E. Sirovich,
MD, MS*

This paper is available at ecp.acponline.org.

years has shifted from a search for personality types or traits linked with disease to an emphasis on modifiable risk behaviors that fluctuate across people and situations.

Despite the continued impact of biobehavioral issues on medical illnesses (e.g., adherence, costs), numerous practical, social, and economic barriers for integrating clinical behavioral science into mainstream health care have yet to be overcome. Indeed, how the health care system can best utilize the conceptual approaches and proven treatments of behavioral medicine in order to adequately implement and integrate them into evidence-based clinical delivery remains unresolved and unspecified.

State of the Evidence

One potential reason for limited utilization of behavioral medicine may be concerns about whether it really works. Like most research literature dating back some years, the quality of the data that support the therapeutic efficacy of behavioral interventions varies. Nevertheless, there are enough studies with good methodologic rigor and positive outcomes to warrant mention. Although a comprehensive critical review of this literature is beyond the scope of this article, a number of excellent reviews are available for the interested reader.^{39, 44–51} In addition, the Center for the Advancement of Health has recently issued a status report on changes in health behavior that provides an extensive summary of behavioral outcome studies for several significant health problems (i.e., cardiovascular disease, depression, diabetes, asthma, and low-back pain) and health risk behaviors (alcohol misuse, diet/nutrition, physical activity, smoking).⁵² The report concludes that psychobehavioral interventions do produce positive clinical change in psychobehavioral, physiological, and health service utilization outcomes but notes that sustained changes (e.g., maintenance) are generally less robust and/or variable. Among the many medical illnesses in which behavioral medicine interventions have effected positive change are cancer and cardiovascular disease.

Studies in Cancer

Many published studies demonstrate the beneficial effects of psychological and behavioral interventions for treating distress, depression, anxiety, nausea, and/or pain in cancer patients. These studies have been summarized in several comprehensive review articles.^{39, 46, 53} Treatments evaluated typically include either cognitive-behavioral therapy, relaxation training, coping/problem-solving skills training, or a combination of these. For example, a study by Fawzy and colleagues⁵⁴ provided a structured group intervention that included behavior therapy, relaxation training, coping skills training, and

emotional support in a randomized study of melanoma patients. Improved psychological functioning as defined by improved coping skills and positive effects on mood, quality of life, and even immune functioning was observed after treatment and at 6-month follow-up assessments. Their findings and those of others⁵⁶ provide support for the efficacy of psychological interventions for improving emotional and physical well-being and perhaps even survival in cancer patients.^{41, 54} The ability of a psychological support intervention to reduce mortality, however, remains equivocal, as a recent trial failed to find a mortality benefit.⁵⁷ **Table 1** presents some frequently cited cancer studies that have examined psychological and behavioral treatments.

Studies in Cardiovascular Disease

Behavioral medicine interventions in cardiovascular disease have focused on lifestyle issues as well as anxiety and depression. Given the general acceptance that lifestyle behaviors, such as smoking, inactivity/lack of exercise, and diet, are significant and modifiable risk factors for cardiovascular morbidity and mortality, many current cardiac rehabilitation efforts^{50, 58, 59} address such behaviors. While a number of studies have demonstrated that behavioral risk factors can be modified,^{60–62} problems with adherence and maintenance are common. One study found that up to 80% of patients did not adhere to therapeutic recommendations.⁶³ Another study in cardiac rehabilitation⁶⁴ had a 50% drop-out rate in the first year. Rates of nonadherence reported in the literature have remained essentially constant over time.⁶⁵ While studies of behavioral medicine interventions in cardiovascular disease are associated with positive outcomes, problems with patient adherence make these benefits difficult to achieve.

The evidence supporting the effectiveness of treating complex problems involving stress, depression, and coronary-prone personality^{66–68} is more questionable. Nevertheless, several studies have demonstrated that behavioral medicine interventions can have a positive effect on outcomes.^{22, 23–25, 28, 69–74} **Table 2** reports a brief summary of some randomized clinical trials in cardiovascular disease that examined psychological and behavioral treatments.

Study Limitations

The limitations of the existing literature on behavioral medicine include the paucity of replication studies, the use of heterogeneous patient groups within the same treatment study, small sample sizes, variable control groups, use of treatments that were not codified or standardized, and potential differences in the pretreatment

TABLE 1

Frequently Cited Studies of Behavioral Medicine Interventions in Cancer Patients

NUMBER OF PATIENTS/TYPE OF DISORDER/REFERENCE	INTERVENTION	LENGTH OF FOLLOW-UP	OUTCOME MEASURE	FINDING	
				TREATMENT	CONTROL
Randomized trials					
86 patients with metastatic breast cancer ⁴¹	Fifty-two 90-minute group sessions of coping, emotional expression, relaxation training, psychological support	10 years	Mean survival (SD)	36.6 months (37.6)	18.9 months (10.8) [†]
235 patients with metastatic breast cancer ⁵⁶	Fifty-two 90-minute group sessions of emotional expression, coping, psychological support	6 years	Median survival (NS)	17.9 months	17.6 months
		1 year	Mean TMD score (SD)*	Baseline, 35.8 (39.6)	Baseline, 27.6 (28.2) Change, 9.7 (24.6) [†]
66 patients with melanoma with anxiety and depression ⁵⁴	Six 90-minute group sessions consisting of health education, problem solving, stress management, psychological support	6 months	Mean TMD score (SD)*		Baseline, 44.46 (21.89) Change, 5.84 [†]
Observational study					
6 patients with mixed cancer diagnoses with anticipatory emesis ⁵⁵	Three to five 30-minute individual hypnosis sessions before chemotherapy	Chemotherapy session	Anticipatory emesis	Change, -1.8 (31.7)	38/69 (55%) sessions with anticipatory emesis [‡]

*Derived from Profile of Mood States. Total Mood Disturbance (TMD) scores range from 0 to 232; higher scores = lower mood. Although there are no norms for the TMD score, the reduction for the treatment group probably represents a clinical reduction in overall distress, with no such improvement noted for the control group.

[†] $P < 0.01$.

[‡] $P < 0.05$.

psychological well-being of patients. Despite these limitations, this literature can be used to select promising interventions for more rigorous study in the future. Indeed, regarding cancer in particular, the National Comprehensive Cancer Network has developed guidelines to promote the investigation of ways to manage psychological distress and related issues.⁷⁵

Cost-Effectiveness

More recent research efforts have begun to explore the cost-effectiveness of behavioral medicine interventions. The utility of behavioral medicine does not lie in revenue generation but in offsetting costs and increasing quality of life. The incorporation of biobehavioral expertise into daily practice holds the promise of substantial cost savings over time, particularly by reducing inappropriate utilization of services. In a recent meta-analysis of the impact of psychological interventions on medical cost offset, Chiles and coworkers⁷⁶ reported that, on average,

psychological intervention reduced length of hospital stay by over 2.5 days and resulted in per-person savings of \$2205. Behavioral medicine interventions in particular were found to produce benefits significantly greater than other forms of psychotherapy.⁷⁶

There are considerable data from methodologically rigorous studies that support the effectiveness of behavioral medicine interventions for relieving distress, depression, anxiety, nausea, and pain and modifying the lifestyle factors, such as smoking, exercise, and diet, that are associated with cancer and cardiovascular disease. While there are limitations to the published literature, the data that do exist are promising and argue for devising stronger studies. One of the most pressing issues is how to integrate behavioral medicine interventions into current clinical practice.

A Model for Practice (The 4 Ts)

In an attempt to provide comprehensive data-driven behavioral medicine services that focus on the relation-

TABLE 2

Frequently Cited Randomized Trials of Behavioral Medicine Interventions in Cardiology*

NUMBER OF PATIENTS/TYPE OF DISORDER/REFERENCE	INTERVENTION	LENGTH OF FOLLOW-UP	OUTCOME MEASURE	FINDING	
				TREATMENT	CONTROL
117 patients with mild essential hypertension ⁷⁰	12 sessions, 45 minutes twice weekly, of breathing–relaxation training and biofeedback	1 year	Patients whose systolic or diastolic blood pressure decreased by >10% from baseline (%)	66%	32% [†]
48 patients with mixed coronary heart disease ⁷¹	Lifestyle program of diet, exercise, stress management, smoking cessation, and group psychological support	5 year	Cardiac hospitalizations per patient	0.82	2.2 [†]
			Any cardiac events per patient (MI, PTCA, CABG, cardiac hospitalization, and death)	0.89	2.3 [†]
585 patients with myocardial infarction ⁷²	Scheduled interaction between case managers and patients after discharge: 14 nurses initiated telephone contacts; progress reports mailed to patients; and 4 individual nurse sessions of exercise testing, diet–drug therapy for hyperlipidemia, and smoking cessation	6 months after MI	Smokers who quit 2 months after MI (non-smoking status was biochemically confirmed) (%)	70%	53% [‡]
			Functional capacity measured by stress tests in resting METS (higher score = better)	9.3 METS	8.4 METS [†]
52 patients with mixed coronary artery disease ⁷³	3 weekly groups of pain management and relaxation training, cognitive reframing, and problem solving	1 month	Weekly chest pain frequency (range 0 to > 5 times/day)	1 less episode/week	0.5 more/week [†]

*CABG = coronary artery bypass grafting; METS = multiples of energy consumption; MI = myocardial infarction; PTCA = percutaneous transluminal coronary angioplasty.

[†] $P < 0.01$

[‡] P value not available.

ships between medical and behavioral health problems, the University of Michigan Behavioral Medicine Clinic has developed a heuristic model of clinical research and practice that seems to work well. We believe the model described here is parsimonious, has clinical utility, and complements those described by others.⁷⁷

Our operational approach is as follows.

- Target a clinical need where there is sufficient evidence that psychological or behavioral variables influence outcome in a patient population that is missed or underserved with respect to these variables. This step should reflect both what is known about the clinical problem and the particular mission of the service-delivery unit.

- Triage through the development of an identification system for problematic cases; this system should function as an integral part of everyday, ongoing clinical care. Here, while academically developed diagnostic interviews, in-depth staff-rating scales, and exhaustive questionnaires may be empirically sound, they may also be impractical and inefficient in the context of clinical care. Brief, reliable, and clinically valid measures may need to be developed and tailored to the needs of an individual clinic or patient population.^{2, 78–83}
- Treat by deploying evidence-based behavioral medicine approaches to target populations. Such treatment involves careful integration of both biomedical and biobehavioral interventions in order to provide comprehensive and appropriate patient care.

- **Track patient outcomes after treatment is complete. This is a critical and necessary step for systematic evaluation and quality improvement. Ideally, tracking should be aligned with triage to correct and improve the system as a whole. The data should describe the patient's morbidity and/or mortality, level of function, and quality of life as well as provide an assessment of the fiscal impact of the intervention.**

An ideal approach would fit into a broader model, such as that described by Hayes and colleagues,⁷⁷ and would employ longitudinal approaches (e.g., repeated measures, multiple-baseline designs), many of which can be adapted readily to the clinic setting.⁸⁴ We are cur-

rently assessing the feasibility of this approach in an ongoing clinical research study with the University of Michigan Multidisciplinary Melanoma Clinic. The goal is to target and treat distressed non-stage IV melanoma patients while taking care not to disrupt ongoing medical practice. **Figure 1** illustrates how the 4 Ts model is guiding this treatment study.

To date, patient response to cognitive-behavioral therapy has been encouraging, and no major disruption in the daily practice of the clinic has been reported. The major difficulties with the study have included patient attrition for personal reasons and problems in recruiting

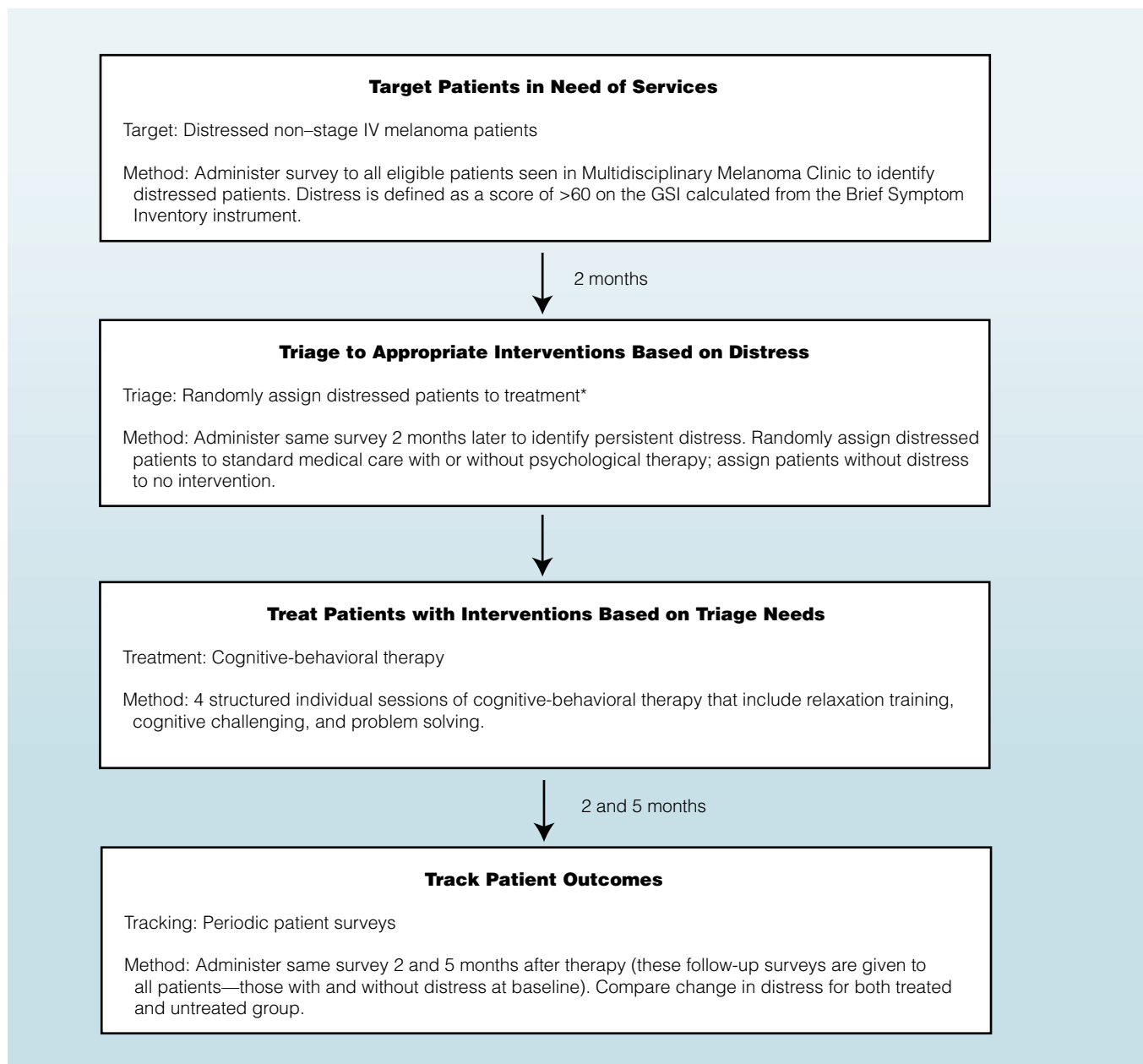


FIGURE 1. Study design using the model for practice (4 Ts). Global Severity Index (GSI) scores ranged from 38 to 80 (mean, 50, SD± 10). We defined distress as a GSI score above 60. Patients with scores in this range reported such symptoms as nervousness or shakiness, poor appetite, anxiety, or depression “quite a bit” or “extremely.” *The randomization step is only necessary for the study. Ordinarily, in implementing the 4T model, patients are assigned to appropriate treatment based on assessment during triage.

patients because of the exclusion criteria and because it is difficult for patients who work full-time or who must travel a distance to the hospital to participate in the treatment. Future applications of the model will need to identify ways to overcome these problems, possibly using repeated follow-up phone calls to patients, brief interventions in the context of scheduled patient visits, or interventions that can occur without requiring that the patient travel to the hospital or clinic (e.g., phone, CD-ROM, or Web-based interventions). An ultimate objective in obtaining evidence for the efficacy and effectiveness of the 4 Ts model is to provide a sound basis for integrating this approach into standard clinical practice. Demonstrating the effectiveness of behavioral medicine treatment would also strengthen the argument for third-party reimbursement of such services; lack of such reimbursement currently constitutes a significant economic disincentive for integrated care.

We believe that the success of the 4 T approach at our institution has been based, in part, on two important factors. First, we received support from pertinent medical services (i.e., internal medicine and psychiatry). To carry out the desired integration, medical services with relevant patient populations had to recognize and support the call for adjuvant care. Second, our medical center was willing to invest in improving service delivery by providing start-up funds for internal clinical research projects. Funding has come from group practice revenues and, while the allocations represented a relatively small proportion of the total budget, the investment has encouraged innovation and interdisciplinary, interdepartmental collaborations.

Looking to the Future

It is now reasonably well established that psychological and behavioral factors contribute to health outcomes and service utilization.^{19,39-43,85-87} Nevertheless, we also know that in practice these factors often remain unidentified, misidentified, or undertreated in standard practice, resulting in suboptimal triage and diminished treatment effectiveness.⁸⁸⁻⁹⁴ A critical challenge for health care, therefore, will be to integrate new biomedical and behavioral medicine knowledge and practice in clinically relevant and economically prudent ways. Also, there is a real need to provide an adequate basis for persuading health care administrators to ease economic disincentives for integrated biobehavioral treatment. An example of such a disincentive is the practice of subcapitating mental health services, which perpetuates the mind-body dualism that has limited the integration of biomedical and behavioral medicine approaches in the past.^{13,95}

To obtain the benefits of more comprehensive integration, it will be necessary to test fully integrated ser-

vices that manage the needs of the patient at several levels. Models for developing such services have been promulgated⁹⁶ and include the 4 Ts approach described here. Approaches that integrate behavioral services into the overall cost structure should help counter past tendencies to separate biomedical and behavioral medicine health services and will be more in keeping with the new Health and Behavior Current Procedural Technology (i.e., billing) codes released in 2002.⁹⁷ These codes provide a mechanism for billing and tracking all services provided to patients. There is also the possibility that these new codes will help counter the managed care practice of pitting economic activities of service delivery units against one another. Given the stated objective of fostering cost-effective and efficacious treatments, it is more than academic to question how managed care will manage biobehavioral risk, prevention, treatment adherence, chronic disease, rehabilitation, and quality of life.

Although the future of health care reform is currently unclear, it is our thesis that a close rapport between biomedical and biobehavioral approaches will be essential and that thoughtful redesign will require systematic testing to provide guidance for payer systems as well as for regulatory agencies and clinician providers. The objective should be to develop a medical care system that is based on comprehensive interventions of demonstrated efficacy, with long-term investments in health that take into account the whole person.

References

1. Frasure-Smith N, Lesperance F, Talajic M. Depression following myocardial infarction: impact on 6-month survival. *JAMA*. 1993;270:1819-25.
2. Frasure-Smith N, Lesperance F, Talajic M. The impact of negative emotions on prognosis following myocardial infarction: is it more than depression? *Health Psychol*. 1995;14:388-98.
3. Powell LH, Thoresen CE. Effects of type-A behavioral counseling and severity of prior acute myocardial infarction on survival. *Am J Cardiol*. 1988;62:1159-63.
4. Andrykowski MA, Redd WH, Hatfield AK. Development of anticipatory nausea: a prospective analysis. *J Consult Clin Psychol*. 1985;53:447-54.
5. Andersen BL. Psychological interventions for cancer patients to enhance the quality of life. *J Consult Clin Psychol*. 1992;60:552-68.
6. Derogatis LP, Morrow GR, Fetting J, et al. The prevalence of psychiatric disorders among cancer patients. *JAMA*. 1983;249:751-7.
7. Farber DM, Wienerman BH, Kuypers JA. Psychosocial distress in oncology outpatients. *J Psychosoc Oncol*. 1984;2:109-18.
8. Stefanek ME, Derogatis LP, Shaw A. Psychological distress among oncology outpatients. *Psychosomatics*. 1987;28:530-9.
9. Roy-Byrne PP, Katon W. Generalized anxiety disorder in primary care: the precursor/modifier pathway to increased health care utilization. [Suppl 3] *J Clin Psychiatry*. 1997;58: 34-8.
10. Pomerleau OF, Brady JP. Behavioral medicine: theory and practice. Baltimore: Williams & Wilkins; 1979.

11. McKegney FP, Schwartz CE. Behavioral medicine: treatment, and organizational issues. *Gen Hosp Psychiatry*. 1986;8:330-9.
12. Pomerleau O, Bass F, Crown V. Role of behavior modification in preventive medicine. *N Engl J Med*. 1975;292:1277-82.
13. Engel GL. The need for a new medical model: a challenge for biomedicine. *Science*. 1977;196:129-36.
14. Rosenman RH, Brand RJ, Jenkins CD, Friedman M, Straus R, Wurm M. Coronary heart disease in the Western Collaborative Group Study: final follow-up experience of 8 1/2 years. *JAMA*. 1975;233:872-7.
15. Siegman AW, Smith TW. *Anger, Hostility and the Heart*. Hillsdale, NJ: Erlbaum; 1994.
16. Mittleman MA, Maclure M, Sherwood JB, et al. Triggering of acute myocardial infarction onset by episodes of anger: determinants of Myocardial Infarction Onset Study Investigators. *Circulation*. 1995;92:1720-5.
17. Freedland KE, Lustman PJ, Carney RM, Hong BA. Underdiagnosis of depression in patients with coronary artery disease: the role of nonspecific symptoms. *Int J Psychiatry Med*. 1992;22:221-9.
18. Levenson JL, Friedal RO. Major depression in patients with cardiac disease: diagnosis and somatic treatment. *Psychosomatics*. 1985;26:91-102.
19. Allison TG, Williams DE, Miller TD, et al. Medical and economic costs of psychologic distress in patients with coronary artery disease. *Mayo Clin Proc*. 1995;70: 734-42.
20. Kamarck T, Jennings JR. Biobehavioral factors in sudden cardiac death. *Psychol Bull*. 1991;109:42-75.
21. Pomerleau OF. Behavioral medicine: the contribution of the experimental analysis of behavior to medical care. *Am Psychol*. 1979;34:654-63.
22. Bennett P, Carroll D. Cognitive-behavioural interventions in cardiac rehabilitation. *J Psychosom Res*. 1994;38:169-82.
23. Langosch W, Seer P, Brodner G, Kallinke D, Kulick B, Heim F. Behavior therapy with coronary heart disease patients: results of a comparative study. *J Psychosom Res*. 1982;53:475-84.
24. Oldenburg B, Allen R, Fastier G. The role of behavioral and educational interventions in the secondary prevention of heart disease. *Clin Abnormal Psychol*. 1989;27: 429-38.
25. Oldenburg B, Perkins RJ, Andrews G. Controlled trial of psychological intervention in myocardial infarction. *J Consult Clin Psychol*. 1985;53:852-9.
26. Frasure-Smith N, Prince R. Long term follow-up of the Ischemic Heart Disease Life Stress Monitoring Program. *Psychosom Med*. 1989;51:485-513.
27. Ornish D, Brown SE, Scherwitz LW, et al. Can lifestyle changes reverse coronary heart disease? The Lifestyle Heart Trial. *Lancet*. 1990;336:129-33.
28. Linden W, Stossel C, Maurice J. Psychosocial interventions for patients with coronary artery disease: a meta-analysis. *Arch Intern Med*. 1996;156:745-52.
29. Eysenck HJ. Personality, stress and cancer: prediction and prophylaxis. *Br J Med Psychol*. 1988;61:57-75.
30. Fox BH, Temoshok L, Dreher H. Mind-body and behavior in cancer incidence. *Advances*. 1988;5:41-56.
31. Andrykowski MA, Redd WH, Hatfield AK. Development of anticipatory nausea: a prospective analysis. *J Consult Clin Psychol*. 1985;53:447-54.
32. Gordon WA, Freidenbergs I, Diller L, et al. Efficacy of psychosocial intervention with cancer patients. *J Consult Clin Psychol*. 1980;48:743-59.
33. Forester B, Kornfeld DS, Fleiss JL. Psychotherapy during radiotherapy: effects on emotional and physical distress. *Am J Psychiatry*. 1985;142:22-7.
34. Spiegel D. The use of hypnosis in controlling cancer pain. *CA Cancer J Clin*. 1985;4:221-31.
35. Genuis ML. The use of hypnosis in helping cancer patients control anxiety, pain, and emesis: a review of recent empirical studies. *Am J Clin Hypnosis*. 1995;37:316-25.
36. Syrjala KL, Donaldson GW, Davis MW, Kippes ME, Carr JE. Relaxation and imagery and cognitive-behavioral training reduce pain during cancer treatment: a controlled clinical trial. *Pain*. 1995;63:189-98.
37. Loscalzo M, Jacobsen PB. Practical behavioral approaches to the effective management of pain and distress. *J Psychosoc Oncol*. 1990;8:139-69.
38. Nezu AM, Nezu CM, Friedman SH, Faddis S, Houts PS. *Helping Cancer Patients Cope: A Problem-solving Approach*. Washington, DC: American Psychological Association; 1998.
39. Compas BE, Haaga DAF, Keefe FJ, Leitenberg H, Williams DA. Sampling of empirically supported psychological treatments for health psychology: smoking, chronic pain, cancer, and bulimia nervosa. *J Consult Clin Psychol*. 1998;66:89-112.
40. Spiegel D, Bloom JR, Yalom I. Group support for patients with metastatic cancer: a randomized prospective outcome study. *Arch Gen Psychiatry*. 1981;38:527-33.
41. Spiegel D, Bloom JR, Kramer HC, Gotthel E. Effect of psychosocial treatment on survival of patients with metastatic breast cancer. *Lancet*. 1989;2:888-90.
42. Fawzy FI, Fawzy NW, Hyun CS, et al. Effects of an early structured psychiatric intervention, coping and affective state on recurrence and survival 6 years later. *Arch Gen Psychiatry*. 1993;50:681-9.
43. Anderson BL. Psychological interventions for cancer patients to enhance quality of life. *J Consult Clin Psychol*. 1992;60:552-68.
44. Burke L, Dunbar-Jacobs J, Hill M. Compliance with cardiovascular disease prevention strategies: a review of the research. *Ann Behav Med*. 1997;19:239-63.
45. Clement S. Diabetes self-management education. *Diabetes Care*. 1995;18:1204-14.
46. Fawzy FI, Fawzy NW, Arndt LA, Pasnau RO. Critical review of psychosocial interventions in cancer care. *Arch Gen Psychiatry*. 1995;52:100-13.
47. Devine E. Meta-analysis of the effects of psychoeducational care in adults with asthma. *Res Nursing Health*. 1996;19:367-76.
48. Gibson P, Coughlan J, Wilson A, et al. Self-management education and regular practitioner review for adults with asthma. *Cochrane Library*. 1999;1.
49. Hajek P. Treatments for smokers. *Addiction*. 1994;89:1543-9.
50. Linden W. Psychological treatments in cardiac rehabilitation: review of rationales and outcomes. *J Psychosom Res*. 2000;48:443-54.
51. Philbin E. Comprehensive multidisciplinary programs for the management of patients with congestive heart failure. *J Gen Intern Med*. 1999;14:130-5.
52. Center for the Advancement of Health. *Health behavior change in managed care: a status report*. Center for the Advancement of Health: Washington, DC; 2000.
53. Jacobsen PB, Hann DM. Cognitive-behavioral interventions. In: Holland JC, ed. *Psycho-oncology*. New York: Oxford University Pr; 1998:717-29.
54. Fawzy FI, Cousins N, Fawzy NW, Kennedy ME, Elashoff R, Morton D. A structured psychiatric intervention for cancer

- patients: I. Changes over time in methods of coping and affective disturbance. *Arch Gen Psychiatry*. 1990;47:720-5.
55. Redd WH, Andresen GV, Minagawa RY. Hypnotic control of anticipatory emesis in patients receiving cancer chemotherapy. *J Consult Clin Psych*. 1982;50:14-9.
 56. Baider L, Uziely B, De-Nour AK. Progressive muscle relaxation and guided imagery in cancer patients. *Gen Hosp Psychiatry*. 1994;16:340-7.
 57. Goodwin PJ, Leszcz M, Ennis M, et al. The effect of group psychosocial support on survival in metastatic breast cancer. *N Engl J Med*. 2001;345:1719-26.
 58. Greenland P, Hayman LL. Making cardiovascular disease prevention a reality. *Ann Behav Med*. 1997;19:193-6.
 59. Trask PC, Stavros MK, Schwartz SM, Rubenfire M. Effectiveness of group stress management on reducing emotional distress in patients with coronary heart disease. New Orleans, LA: Society of Behavioral Medicine; 1998.
 60. Kottke TE, Battista R, Defriese G, Breek M. Attributes of successful smoking cessation interventions in medical practice: a meta-analysis. *JAMA*. 1988;259:2882-9.
 61. Bowen DJ, Henderson M, Iverson D, et al. Reducing dietary fat: understanding the success of the Women's Health Trial. *Cancer Prevention International*. 1994;1:21-30.
 62. O'Conner GT, Buring JE, Yusuf S, et al. An overview of randomized trials of rehabilitation with exercise after myocardial infarction. *Circulation*. 1989;80:234-44.
 63. Dunbar-Jacobs J, Burke LE, Puczynski S. Clinical assessment and management of adherence to medical regimens. In: Nicassio PM, Smith TW, eds. *Managing Chronic Illness: A Biopsychosocial Perspective*. Washington DC: American Psychological Assoc; 1995:313-49.
 64. Oldridge NB. Compliance and dropout in cardiac exercise rehabilitation. *J Cardiol Rehabil*. 1984;4:166-77.
 65. Dunbar-Jacobs J, Dwyer K, Dunning EJ. Compliance with antihypertensive regimens: a review of the research in the 1980's. *Ann Behav Med*. 1991;13:32-9.
 66. Frasure-Smith N, Lesperance F, Prince RH, et al. Randomised trial of home-based psychosocial nursing intervention for patients recovering from myocardial infarction. *Lancet*. 1997;350:473-9.
 67. Freedland KE, Carney RM, Hance ML, Skala JA. Cognitive therapy for depression in patients with coronary artery disease. *Psychosom Med*. 1996;58:93.
 68. Friedman M, Powell LH, Thoresen CE, et al. Effect of discontinuance of type-A behavioral counseling on type-A behavior and cardiac recurrence rate of post myocardial infarction patients. *Am Heart J*. 1987;114:483-90.
 69. Black JL, Allison TG, Williams DE, Rummins TA, Gau GT. Effect of intervention for psychological distress on rehospitalization rates in cardiac rehabilitation patients. *Psychosomatics*. 1998;39:134-43.
 70. Aivazyan TA, Zaitsev VP, Salenko BB, Yurenev AP, Patrusheva IF. Efficacy of relaxation techniques in hypertensive patients. *Health Psychol*. 1988;7:193-200.
 71. Ornish D, Scherwitz LW, Billings JH, et al. Intensive lifestyle changes for reversal of coronary heart disease. *JAMA*. 1998;280:2001-7.
 72. DeBusk RF, Miller NH, Superko HR, et al. A case-management system for coronary risk factor modification after acute myocardial infarction. *Ann Intern Med*. 1994;120: 721-9.
 73. Payne TJ, Johnson CA, Penzien DB, et al. Chest pain self-management training for patients with coronary artery disease. *J Psychosom Res*. 1994;38:409-18.
 74. Amarosa-Tupler B, Tapp JT, Carida RV. Stress management through relaxation and imagery in the treatment of angina pectoris. *J Cardpulm Rehabil*. 1989;9:348-55.
 75. Holland JC. Preliminary guidelines for the treatment of distress. *Oncology*. 1997; 11:109-14.
 76. Chiles JA, Lambert MJ, Hatch AL. The impact of psychological interventions on medical cost offset: a meta-analytic review. *Clin Psychol Sci Prac*. 1999;6:204-20.
 77. Hayes SC, Barlow DH, Nelson-Gray RO. *The Scientist Practitioner: Research and Accountability in the Age of Managed Care*. 2nd ed. Boston: Allyn & Bacon; 1999.
 78. Walker EA, Roy-Byrne PP, Katon WJ. Irritable bowel syndrome and psychiatric illness. *Am J Psychiatry*. 1990;147:565-72.
 79. Schwartz SM, Fontana RJ, Trask PC, Macklem D, Deaneer SL. Interferon induced emotional distress in treatment refractory hepatitis C patients. *Psychosom Med*. 2000;62:137.
 80. Derogatis LR, Melisaratos N. The Brief Symptom Inventory: an introductory report. *Psychol Med*. 1983;13:595-605.
 81. Derogatis LR. *The Brief Symptom Inventory (BSI) Administration, Scoring and Procedures Manual-II*. Clinical Psychometric Research; 1992.
 82. Boulet J, Boss MW. Reliability and validity of the Brief Symptom Inventory. *Psychol Assess*. 1991;3:433-7.
 83. Ware JE. *SF-36 Health Survey: Manual and Interpretation Guide*. Boston, MA: Health Institute, New England Medical Center; 1993.
 84. Keppel G. *Design and Analysis: A Researcher's Handbook*. 3rd ed. Englewood Cliffs, NJ: Prentice Hall; 1991.
 85. Spiegel D, Sephton SE, Stites DP. Effects of psychosocial treatment in prolonging cancer survival may be mediated by neuroimmune pathways. *Ann NY Acad Sci*. 1998;840:674-83.
 86. Richardson JL, Shelton DR, Krailo M, Levine AM. The effect of compliance with treatment on survival among patients with hematologic malignancies. *J Clin Oncol*. 1990;8:356-64.
 87. Hermann C, Brand-Driehorst S, Kaminsky B. Diagnostic groups and depressed mood as predictors of 22-month mortality in medical inpatients. *Psychosom Med*. 1999;60:570-7.
 88. Schwartz SM, Trask PC, Ketterer M. Understanding chest pain: what every psychologist should know. *J Clin Psychol Med Settings*. 1999;6:333-51.
 89. Dart AM, Davies HA, Dalal J, Ruttley M, Henderson AH. "Angina" and normal coronary arteriograms: a follow-up study. *Eur Heart J*. 1980;1:97-100.
 90. Kemp HG, Kronmal RA, Vlietstra RE, Frye RL. Seven-year survival of patients with normal or near normal coronary arteriograms: a CASS Registry Study. *J Am Coll Cardiol*. 1986;7:479-83.
 91. Bass C, Wade C, Hand D, Jackson G. Patients with angina and normal and near normal coronary arteries: Clinical and psychosocial state 12 months after angiography. *Brit Med J*. 1983;287:1505-7.
 92. Potts SG, Bass CM. Psychosocial outcome and use of medical resources in patients with chest pain and normal or near-normal coronary arteries: a long-term follow-up study. *Quart J Med*. 1993;86:583-93.
 93. Swinson RP, Kuch K. Clinical features of panic and related disorders. In: Ballenger JC, ed. *Clinical Aspects of Panic Disorder*. New York: Wiley-Liss; 1990:13-30.
 94. Beitman BD, Basha I, Flaker G, DeRosear L, Mukerji V, Lamberti JW. Major depression in cardiology chest pain patients without coronary artery disease and with panic disorder. *J Affect Dis*. 1987;13:51-9.

95. Schowalter JE. Some early lessons from the rise of managed behavioral health care in the United States. *Isr J Psychiatry Relat Sci.* 1998;35:165-73.
96. Gallagher RM, McCann WJ, Jerman A, Hughes J, Langelier R, Stewart F. The behavioral medicine service: an administrative model for biopsychosocial medical care, teaching, and research. *Gen Hosp Psychiatry.* 1990;12:283-95.
97. Foxhall K. New CPT codes will recognize psychologists' work with physical health problems. *Monitor on Psychology.* 2000;31:46-7.

Acknowledgments

We thank Dr. Norman Anderson for input on previous versions of this manuscript.

Correspondence

Peter C. Trask, PhD, Behavioral Medicine Program, University of Michigan, 475 Market Place, Suite L, Ann Arbor, MI 48108-0757; telephone: 734-998-6420; fax: 734-998-6423; e-mail: pctrask@umich.edu.