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Integration of Medical Care and Worksite Health Promotion

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THIS ARTICLE examines the role of worksite health promotion in the context of the changing American workplace and the rapidly evolving US health care system. Societal changes are altering the structure, incentives for, and locations of work, as well as the organization and provision of health care services. These changes—including trends toward corporate downsizing and part-time employment, desktop computing and telecommuting, and increasing employer health costs¹—provide opportunities to rethink the role of health promotion in the workplace and to better integrate medical care and preventive services for employees and their dependents.

For many years, medical and health promotion perspectives developed along parallel but separate tracks, owing to the different emphases they placed on curative and preventive strategies and the tensions between these alternative, yet complementary, approaches to health care.²⁻⁴ Recently, the need to reduce rapidly escalating health costs, the shift toward outpatient services and managed care, and the emergence of community care networks have created a more favorable climate for collaboration among physicians, hospital administrators, and health promotion specialists.⁵⁻⁷ Clearly, the prospects for meeting the Healthy People 2000 goals for the nation and achieving a more cost-effective health care system will be improved to the ex-

tent that medical and disease prevention strategies can be better integrated in the coming years.⁸⁻¹²

Our discussion of the expanding interface between medicine and health promotion focuses primarily on the worksite—an arena that is especially amenable to the development and delivery of more integrated approaches to health care. *Worksites* are those settings in which one or more individuals engage in work-related tasks, including the offices, factories, warehouses, and other facilities controlled by organizations, vehicles operated by employees (eg, trucks, buses, taxis), and residential offices of home workers. Worksites afford a high degree of leverage for influencing the health of the population. More than 110 million persons are employed in the United States and an additional 100 million of their dependents are potentially affected by worksite health programs, and many adults spend a substantial proportion of time at work each week (nearly one third of their waking hours).^{13,14} Moreover, worksite health programs are likely to assume increasing importance in the national debate about managed care, since many large self-insured corporations have implemented and evaluated alternative plans for managing employee health costs during the past decade. This extensive corporate database can help inform future efforts to develop managed care models that are maximally effective with regard to their health and cost benefits.¹⁵

PREVALENCE AND EFFECTIVENESS OF WORKSITE HEALTH PROGRAMS

During the past 15 years, worksite health promotion programs in the United States expanded rapidly in response to regulatory, economic, and social forces.¹³

A major incentive for employer investment in worksite health promotion has been the rapid and sustained increase in health benefit costs since the late 1970s, despite substantial corporate investments in a variety of cost-control strategies.¹⁶ In recent years, corporations paid an estimated 30% to 40% of the national health expenditures, the total of which grew from about 6% of the gross national product in 1966 to nearly 14% in 1992.^{9,17,18} Health promotion programming has been embraced as a rational effort to prevent the high-cost illnesses that consume the majority of corporate health benefit dollars.¹⁹ Employers' investment in health promotion programs is supported by a growing number of well-designed epidemiologic studies relating modifiable risk factors for heart disease, many cancers, stroke, and common causes of morbidity, such as lower back and repetitive strain injuries. Public policy statements, such as the surgeon general's 1979 report on health promotion and disease prevention²⁰ and the 1991 publication of *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*,¹¹ have emphasized the potential benefits of investment in disease prevention and health promotion programs.

A national survey of 1358 worksites in 1985 indicated that two thirds of the participating companies (with 50 or more employees) offered at least one health promotion activity.²¹ Smoking cessation, health risk appraisal, back care, stress management, and physical fitness programs were the most frequently cited health promotion activities at these worksites. Spouses and dependents of workers, as well as retirees, were found to have less access to corporate health programs than employees. Specifically, all permanent employees were eligible to participate in health promotion ac-

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tivities at 85.4% of the worksites, whereas spouses and dependents were eligible for these programs at only 30.1%, and retirees at 30.4%, of the participating companies.

A second national survey of 1507 worksites found that, by 1992, 81% of the companies sampled offered at least one health promotion activity.²² The activities mentioned most frequently in the 1992 survey included injury prevention, physical fitness, smoking control, and stress management, with the prevalence of worksite smoking policies increasing by 118% between 1985 and 1992. Both the 1985 and 1992 surveys indicated that larger companies sponsor a broader array of health promotion activities than smaller ones. In 1992, for example, worksites with 750 or more employees were nine times as likely to offer cancer screening programs than companies with fewer than 100 workers, and about three times as likely to provide blood pressure control, physical fitness, and weight management programs.²²

As corporate investment in worksite wellness programs grew during the 1980s, scientific efforts to evaluate the health and cost benefits of these initiatives also expanded. Between 1980 and 1993, 48 peer-reviewed studies evaluated the effectiveness of worksite health programs. Two recent reviews of these evaluations found convergent evidence of improved health outcomes relative to smoking cessation, weight loss, and coronary heart disease risk factor reduction after employees' participation in worksite health programs.^{23,24} Also, among the 31 programs that were evaluated in terms of cost-effectiveness or cost-benefit criteria, only one failed to indicate a positive return on investment. Evaluations ranged from 6 months to 6 years, with the studies of longest duration, the largest number of participants, and the most rigorous research designs (randomized clinical trials) occurring since 1991.

Specific health promotion strategies that show promise for being both health- and cost-effective include (1) intensive marketing efforts to obtain high levels of initial and continuing participation among employees in worksite health programs²⁵; (2) targeting all employees but providing higher levels of program intensity to those with identified medical risk factors^{26,27}; (3) employee participation in health risk appraisal and lifestyle change programs^{28,29}; (4) comprehensive worksite health programs that provide multiple, periodically updated program offerings targeting a wide range of risk factors and medical problems^{19,26,30}; (5) employer policies banning smoking at the worksite and requiring the use of safety belts in all employer vehicles and

company-sponsored trips^{11,31,32}; and (6) personalized telephone contacts, counseling, and feedback to recruit employees into medical screening programs and encourage their adherence to recommended lifestyle changes.^{33,34}

LIMITATIONS EVIDENT IN EARLIER WORKSITE HEALTH PROGRAMS

Although evaluative studies have documented the health and financial benefits of worksite-based programs, they also reveal some important shortcomings in earlier interventions. First, most corporate health programs implemented to date have been limited rather than comprehensive in scope. These programs have emphasized risk-factor reduction strategies (eg, smoking cessation, stress management, health risk appraisal) but have not integrated disease prevention and safety programs with organizational policies to enhance the physical and social quality of the workplace.^{13,23,35,36}

Second, previous worksite interventions (especially during the 1970s and early 1980s) emphasized primary prevention efforts to enhance wellness and reduce illness risks, while neglecting opportunities to combine health promotion with secondary prevention (early detection and treatment of disease) and tertiary prevention strategies (medical and rehabilitative services to minimize morbidity and hasten recovery from disease). Ideally, employers could offer worksite wellness activities in conjunction with a variety of preventive services (eg, periodic physical examinations and screening for hypertension, high cholesterol level, and cancer risk) and rehabilitative programs to facilitate workers' recovery from cardiac events, back injuries, and other medical problems. An encouraging trend in this regard is the higher percentage of companies that offered some form of preventive service between 1985 (30%) and 1992 (52%).²² Nonetheless, preventive services at the worksite are often provided in piecemeal fashion, rather than as part of a more comprehensive approach that integrates health promotion strategies with diagnostic and rehabilitative services.^{24,37}

Third, worksite health resources have been unevenly distributed among different segments of the labor force. In general, access to corporate health programs has been greater among permanent employees who work for larger companies at a single worksite. For other groups, such as highly mobile workers (eg, drivers, sales personnel) or those employed by small businesses, residing in rural areas, and working in such industries as agriculture, mining, construction, and manufacturing, the availability of worksite health programs has been

more limited. Access to corporate health programs also has been lower among chronically or transiently unemployed individuals, employee dependents and retirees, and individuals whose social, cultural, or educational backgrounds make them less responsive to commonly used health promotion messages.^{20,22}

Fourth, although there is increasing evidence of the health and cost benefits of certain interventions (eg, personalized counseling and follow-up sessions to enhance employees' hypertension control, weight loss, and smoking cessation³³; health risk appraisal and behavioral change programs^{28,29}), many worksite-based programs implemented in previous years have not been rigorously evaluated for their health- and cost-effectiveness. Among those programs that have been evaluated, the conclusiveness of research findings is sometimes limited by methodologic constraints, such as non-random assignment of workers to intervention and control groups, the use of narrowly circumscribed measures to evaluate employee health status, and the lack of standardized criteria for calibrating the cost-effectiveness of worksite programs.^{35,38}

Finally, as companies expand their efforts to reduce employee health costs through managed care, health risk appraisal, mental health counseling, and medical surveillance programs, potential conflicts of interest can arise between employers' financial concerns, employees' privacy rights, and physicians' concerns about patients' well-being.^{38,39}

PROGRAMMATIC CHALLENGES FOR HEALTH PROMOTION

The limitations evident in earlier health promotion programs suggest several strategies for improving the design and evaluation of future worksite initiatives. Four general categories of programmatic directions for the future are as follows: (1) the development of closer ties between worksite health promotion programs and medical service providers; (2) the establishment of ethical standards for worksite health promotion to protect employee privacy and job security; (3) the integration of corporate policies, environmental enhancement, and behavioral change strategies to create healthier workplaces that are responsive to community needs; and (4) the development of improved methods for evaluating the health outcomes and cost-effectiveness of corporate wellness policies and programs.

Integration of Worksite Health Promotion With the Medical Care System

The organization of health services in the United States is rapidly evolving

toward a managed care system that will place increasing emphasis on cost containment and the development of communitywide partnerships among physicians, hospitals, insurance carriers, and employer organizations for more integrated health care provision. These ongoing changes afford unique opportunities to better integrate worksite health promotion programs with medical care services.

Linking Primary, Secondary, and Tertiary Prevention Strategies.—The integration of primary, secondary, and tertiary prevention efforts does not mean that worksite health programs should duplicate community-based medical services. Rather, worksite programs should complement and reinforce the medical services provided by physicians working in nonoccupational health care settings. For instance, a physician whose patient is returning to work after coronary bypass surgery could collaborate with worksite health professionals to develop a plan for monitoring the employee's physiologic status at work, facilitating his or her compliance with prescribed medication regimens, and encouraging the development and maintenance of improved health habits (eg, through stress management, smoking cessation, physical fitness, and a low-fat diet). This approach has been implemented effectively in the cardiac rehabilitation program at Stanford (Calif) University for recovering patients at the worksite.³⁷

At the same time, corporate programs that provide routine medical surveillance and health risk appraisals could identify employees at greatest risk for subsequent health problems (eg, those with hypertension or elevated blood glucose levels) and refer them to community-based physicians. Additional examples of worksite-based preventive services that could be integrated with corporate health promotion programs include on-site mammography screening, immunization against influenza, cholesterol monitoring, company-sponsored self-care programs, and nonoperative treatment of patients with lumbar disk herniations and lower back pain.^{22,29,30,40-42}

Developing Innovative Applications of New Provision Technologies.—An important priority is the development of new technologies for providing cost-effective worksite wellness and health care programs. Examples include medical surveillance and risk-appraisal programs that use mail contacts to monitor and encourage changes in individuals' health behavior, self-care books, nurse educator telephone counseling with employee groups, and "electronic house calls" to extend primary care services to patients at their homes and worksites.^{28,37,42-44} One

program consisting of health risk assessments mailed at 6-month intervals, combined with self-care instructional materials and personalized recommendation letters emphasizing behavioral risk reduction, achieved improvements in computed health risk scores of 18.4% at 18 months and 25.7% at 30 months among participants aged 64 years and younger.²⁸ This same program resulted in lower rates of medical insurance claims relative to case controls (who received printed materials only) and self-reported use of medical services from baseline.²⁹

Also, telecommunications technologies, such as Internet listservers and bulletin boards, electronic mail, fax, video-based computer-interactive systems, and interactive cable television (eg, the National Health Network), could be used more widely in corporate settings to encourage employee participation in worksite wellness activities and to deliver multimedia educational programs on risk-factor reduction, disease prevention, and environmental health and safety.³⁰

Improving Access to Populations That Are Difficult to Reach.—Future worksite health initiatives should ensure greater access among employees who are relatively difficult to reach and should be tailored to the unique needs of small and medium-sized companies, as well as those of larger corporations. One study demonstrated the effectiveness of health promotion programs in small companies, owing to the greater opportunities for personalized feedback and goal setting in small vs large organizations.⁴⁵ Yet, small businesses generally offer fewer health promotion and disease prevention programs than large companies, because of their relative lack of staff, financial resources, and economies of scale. These barriers to health promotion programming in small firms may be lowered as managed care providers make routine preventive services and wellness activities available within their employee health programs, and as legislative reforms require companies of all sizes to establish worksite injury and illness prevention programs.⁴⁶

Programs that can effectively reach highly mobile workers, those based in rural locations, uninsured employees, spouses and dependents, and retirees are additional priorities, as are those that address the needs of workers temporarily or chronically unemployed because of corporate downsizing, layoffs, and business closures. In a study conducted by the Michigan Prevention Research Center, community interventions designed to assist unemployed workers through counseling services and increased social support yielded significant mental health

benefits and reemployment gains among program participants, relative to case controls.⁴⁷ Also, studies of employee risk appraisal and medical surveillance programs indicate that mail and telephone contacts initiated by nurses and health educators are effective in reducing behavioral risks for acute and chronic disease.^{28,30,37,44} These same strategies can be used to provide medical and preventive services to mobile and rural workers, dependents, and retirees located away from centralized worksites and community health centers.

Finally, corporate health initiatives should be organized to address better the needs of racially and ethnically diverse populations and incorporate strategies for actively involving these underserved groups in health enhancement programs (eg, through the development of multilingual and culturally sensitive health communications).⁴⁸⁻⁵³

Integrating Health Promotion and Disease Prevention Into Corporate Benefit Plans.—Many companies that establish their own health benefit plans (as frequently occurs in large corporations) do not include health promotion and clinical preventive services among the benefits provided to employees and dependents. For example, immunizations for children are often omitted from corporate health plans, and even when they are included, many children remain unimmunized, highlighting the need for closer coordination between worksite benefit plans and clinical service providers.⁵⁴ To correct these deficiencies, employee benefit plans should routinely include preventive services and health promotion activities for which effectiveness has been well documented.⁵⁵ Companies also should expand their efforts to improve employees' and dependents' access to preventive services. The cost-effectiveness of integrating health promotion programs into corporate benefits plans was demonstrated in a 5-year evaluation of a worksite health intervention for approximately 4000 city employees in Birmingham, Ala.²⁷ That program, which combined yearly medical screening, health education, preventive services, and physician referrals for high-risk employees, held the costs of benefits constant while they increased in other areas of the state. The average medical benefits expenses per Birmingham employee, which were 24% (or \$397) higher than the state average at the outset of the study, were 30% (or \$922) lower than the state average by the fifth year of the program.

Developing Worksite Health Programs That Are Compatible With Managed Care.—Worksite health programs that are consistent with and have the potential to improve managed care ap-

proaches to health services delivery (eg, via partnerships among employer corporations, health maintenance organizations, exclusive and preferred provider organizations) are a major priority. Especially needed are programs that (1) better integrate health promotion and disease prevention strategies with the medical service modalities currently emphasized by health maintenance organizations and preferred provider organizations^{8,10,56}; (2) establish policies and procedures within employer and health maintenance organizations to ensure that the quality of patient care and preventive services is maintained at a high level and not compromised by financial cost-containment goals; (3) further evaluate the capacity of worksite health promotion and disease prevention programs to reduce the use of medical services by employees, retirees, and their dependents, and the financial costs of health insurance claims^{5,29}; and (4) create new alliances among hospitals, insurance carriers, employer organizations, and primary care service providers, with a mutually shared risk relative to capitated health programs.^{7,24} The development of corporate wellness coalitions (such as the Bay Area and Washington Area Business Groups on Health) and evaluations of worksite health programs based on community vs experience rating systems are important directions for the future.

Strengthening Ethical Standards to Protect Employee Privacy and Job Security

The development and linkage of managed care, health risk appraisal, employee assistance, and medical surveillance programs at the worksite may pose a variety of ethical dilemmas for physicians and other health professionals employed by or working in employer organizations. A major problem is how to protect confidential health information when dissemination of that information, intentional or inadvertent, can adversely affect an employee's job situation and lead to reassignment, lack of advancement, or even preferential termination.

Potential Conflicts of Interest Between Management and Health Professionals.—There is a fundamental tension between management's desire to maximize workers' productivity and reduce their health benefit costs, and physicians' responsibility through oath and law to protect employee privacy and ensure the confidentiality of all health information. For example, management may want to know whether frequent absences of an employee are caused by the acquired immunodeficiency syn-

drome or some other progressive disease that requires staff realignment; or whether employees who are at highest risk for coronary artery disease are taking active steps to reduce their risks. The company physician, who knows the answers on the basis of the results of company-sponsored employee counseling, health risk appraisal, or medical surveillance programs, is in the middle. The physician needs not only to be the patient confidant and advocate but also to satisfy management that he or she is safeguarding the company's interests.

Given the likelihood of these potential conflicts of interest, it is crucial that worksite health promotion programs develop and adhere to clear ethical standards and procedural guidelines for ensuring the confidentiality of health information. Levitt⁵⁷ noted that workers participating in employee counseling programs must be assured that their health data will not be shared with others without their written consent, except as required by law (such as in cases of potential suicide, homicide, or child abuse). Counseling records must be securely maintained with restricted access and should not become part of the employee's personnel file. Other safeguards include the use of third parties to gather, code, and analyze employee health data, and the use of numeric codes rather than employee names in computerized and written medical records.

The best patient safeguard, beyond the physical security of all hard copy and software records, is a climate of highly ethical behavior where both explicit policy and practice reinforce probity in health professional conduct and any lapses are cause for dismissal. However, it is difficult for employees to be sure that information provided to medical personnel will remain confidential, and some employees may decide not to participate or may provide unreliable information when they mistrust the health services department. The trend toward using outside vendors rather than company employees to provide health services may reduce the likelihood that confidentiality will be breached.

Health Promotion Programming, Medical Screening, Employment Eligibility, and Job Security.—Worksite health promotion programming, where the objective is to identify risks for illness and strategies for health improvement, has largely supplanted the traditional preemployment physical, which was meant to identify those with conditions that might preclude employment. This change is largely the result of legal restrictions on the use of medical information in determining job suitability. Exceptions are those positions for which specific physical or other requirements

have been established for successful job performance of the job (eg, police and fire department work, jobs requiring heavy lifting). Preemployment screening for illicit substances (but not legal substances, such as alcohol) may also be conducted and can be grounds for denying employment. Screening for human immunodeficiency virus may not be performed without a job applicant's or employee's permission. Employers are reluctant to obtain preemployment information (other than the use of illicit substances) because if employment is denied, it may be difficult for them to refute the presumption that they had access to health screening information that could have influenced their decision-making process.

Future worksite health promotion services are likely to be more closely integrated with employee assistance and medical surveillance programs. Periodic health examinations to meet Occupational Safety and Health Administration requirements, for example, can include tests and counseling services designed to ascertain, track, or reduce health risks as diverse as smoking, hypertension, and stress. However, employee participation in activities not required by federal or state agencies should be voluntary, with previous informed consent. The integration of data from both required and voluntary activities may help ensure that confidentiality of information is respected, since governmental requirements impose procedural safeguards to ensure that personal health data are not made available to management.

Creating Healthier Worksites Through Comprehensive Programs Responsive to Community Needs

Future worksite health programs will be more effective to the extent that they are comprehensive in scope and consistent with the demographic and technologic realities that are transforming the organization of work, the structure of households, and the composition of the labor force.

Developing More Comprehensive Approaches to Worksite Wellness.—Rosen and Berger's⁵⁸ concept of "healthy companies" highlights the importance of implementing comprehensive, multifaceted programs to promote employee well-being. Earlier studies have examined the health and financial impacts of focused interventions to improve workers' health habits, the environmental quality of their worksites, or the social climate of their organizations.⁵⁹⁻⁶⁴ Others have shown that multicomponent interventions achieve greater health and cost benefits than single-component programs. For example, a broad-gauged risk

reduction program that encompassed both changes in lifestyle and medication resulted in significantly greater reductions in the progression of atherosclerosis during a 4-year period than did medical treatment alone.³⁰ Similarly, an intervention that combined health education, follow-up counseling, and corporate efforts to establish health communication networks and support groups was five to six times more cost-effective in reducing cardiovascular risks and in preventing relapse among ex-smokers than was health education alone.³⁶

Relatively few programs that are truly comprehensive in scope (ie, that combine health risk appraisal, lifestyle change, employee counseling and support groups, medical interventions, environmental enhancement, and health-supportive facilities planning) have been implemented and evaluated to date.^{13,65} The worksite health programs developed by certain large companies, such as AT&T, Kansas City, Mo, and Johnson & Johnson, New Brunswick, NJ, are exceptions to this trend, although, even in those cases, the health and cost efficacy of environmental change strategies have not been assessed.^{35,66,67}

The goal of creating healthy companies through multifaceted interventions suggests some important tasks for the future. Corporate health programs should integrate and evaluate the joint effects of "active" and "passive" interventions on employee well-being.⁶⁸ Active interventions include a variety of behavioral change and lifestyle modification programs (eg, smoking cessation, exercise, and dietary interventions) that require voluntary and sustained effort by individuals to achieve the desired health benefits. Passive interventions subsume organizational policies and environmental changes (eg, establishing smoke-free worksites, flex time and job-sharing programs, physical fitness facilities and on-site child care) that require little or no effort on the part of individuals. The joint effects of these different interventions on employee health remain to be evaluated in future research.

Also, occupational homicide and non-fatal assaults on employees at the worksite are an increasing problem in the United States, yet little is known about the cause and prevention of intentional injuries in work settings.⁶⁹ Between 1980 and 1989, homicide was the leading cause of occupational death from injury among women and the third leading cause of death for all workers.⁶⁹ Corporate health promotion programs that teach employees conflict resolution and stress management skills and those aimed at reducing the stressfulness of work en-

vironments can play an important role in ameliorating workplace violence.⁷⁰ Important priorities for the future are to (1) identify major risk factors for workplace violence (eg, working alone or in small numbers, late at night or during early-morning hours, and in high-crime neighborhoods); and (2) develop and implement worksite violence prevention programs that integrate behavioral, organizational, and facilities design strategies (eg, modification of work schedules and procedures, provision of employee training programs for crisis intervention, enhancement of surveillance and emergency response systems).

Health Consequences of Corporate Downsizing, Job Strain, and Unemployment.—The economic recession of the 1980s and 1990s increased the unemployment rate among US workers and prompted major changes in corporate structure, including downsizing, "re-engineering," and a shift from full-time to part-time work in many sectors of the economy. These changes have placed greater job demands on employees, who are often asked to do more work for less compensation. At the same time, employees are confronted by more frequent changes in the physical arrangement and location of their worksite^{71,72} and the threat of job displacement through workplace automation.⁷³

The demand-control model of occupational stress^{74,75} suggests that highly demanding jobs, which afford minimal opportunities for exercising "decision latitude" and personal control, create the greatest psychological strains and vulnerability to stress-related diseases. These occupational health risks can be expected to become more severe during times of rapid economic, organizational, and technologic change. Moreover, the higher levels of stress and interpersonal strain brought about by corporate restructuring and impending job loss may increase the incidence of employee burnout and workplace violence.⁷⁶⁻⁷⁸

The socioeconomic and technologic changes that have transformed the US workplace in recent years pose several challenges for worksite health promotion. First, high-strain jobs can be redesigned to achieve a better balance between workers' psychological needs for autonomy, the day-to-day demands of their work, and the performance criteria of their employers.^{73,75,79,80} Second, employers should develop new resources to provide counseling and support for workers coping with job insecurity, relocation, and outplacement.⁸¹ Third, employee assistance programs, which provide workers and dependents with a variety of assessment, counseling, referral, and case management services

for substance abuse, mental health, and other problems, should be integrated with worksite health promotion programs.^{57,81} Finally, corporate programs to assist employees who have lost their jobs, as they make the transition to new careers, should be developed and evaluated for their effectiveness in preventing the health problems often associated with unemployment.⁸²⁻⁸⁴

Improved Methods for Evaluating the Health Outcomes and Cost-effectiveness of Worksite Programs

The development of more rigorous approaches to evaluating the health and cost benefits of corporate wellness programs will provide a stronger empiric basis for maximizing the effectiveness of these initiatives. A key criterion for judging the value of corporate wellness programs is the extent to which they result in improved health outcomes (ie, the health-effectiveness of the programs). Earlier studies of worksite health programs often have used divergent and nonstandardized measures to assess changes in employees' health status as a function of their participation in these programs. Therefore, a priority for the future is to develop broader-gauged program evaluations that consolidate previously disparate measures of the health impacts of worksite interventions (eg, biomedical, behavioral, and psychosocial indexes of employee health).

By using a wider array of measurement strategies, future evaluations of corporate health programs will be better able to test hypothesized links between behavioral and environmental interventions at the worksite, physiologic and psychosocial processes, and disease or wellness outcomes.^{65,85}

Another important direction is to develop improved methods for evaluating the organizational and financial outcomes of worksite health programs.^{16,23,38,86}

The anticipated cost-effectiveness of worksite interventions is an important factor in corporate decisions to implement, discontinue, or postpone health promotion programs. Cost-effectiveness is defined as net program costs expended per health benefits achieved. The cost-effectiveness of worksite health interventions during a 6-month to 5-year period has been increasingly demonstrable.^{24,27,29,33} Future evaluations of the cost-effectiveness of worksite health programs should incorporate a wider array of productivity and organizational effectiveness criteria than has been used in the past (eg, reflecting the quantity, quality, and timeliness of employees' work performance; aggregate rates of

absenteeism, staff turnover and retention; frequency and quality of communication among coworkers; and the company's reputation in the broader community).⁸⁷⁻⁹¹

CONCLUSIONS

Recent and impending changes in the US health care system and refinements in methods for improving employee health have created favorable conditions for achieving a more thorough integration of worksite health promotion and medical care services than has been possible in the past. A growing body of research testifies to the effectiveness of many worksite health promotion programs in reducing illness risks, improving employee well-being, and lowering employers' health benefit costs. Also, capitated health programs have established shared incentives for cost containment among physicians, hospitals, insurance companies, and employer organizations. As community care networks emerge, the success of hospitals and other medical settings will depend on how well they establish partnerships for health promotion with local businesses, government, agencies, and schools, and a strong reputation for high-quality patient care. Likewise, health education and self-care programs provided by nonmedical personnel can benefit hospitals and physicians by reducing the demand for nonacute care and enabling them to focus on medical services that are of highest priority to the community.⁵

More than ever before, physicians, hospitals, employer organizations, and public agencies share a common stake in providing affordable, accountable, and accessible health care.⁹ The modern epidemics of chronic disease, acquired immunodeficiency syndrome, neighborhood and workplace violence, and unintentional injuries have placed an enormous burden on society during the past two decades.^{11,69,92} The initiatives outlined herein can help reduce the economic and human toll associated with these contemporary health problems by fostering a more integrative approach to health improvement and a more cost-effective health care system.

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References

1. Rethinking work. *Business Week*. October 17, 1994:74-93. Special report.
2. Henderson DA, Scutchfield FD. Point-counterpoint: the public health versus the medical model of prevention. *Am J Prev Med*. 1989;5:133-119.
3. McKinlay JB. A case for refocusing upstream: the political economy of illness. In: Enelow AJ, Henderson JB, eds. *Applying Behavioral Science to Cardiovascular Risk*. Washington, DC: American Heart Association; 1975:7-17.
4. World Health Organization. Health promotion: a discussion document on the concept and principles. *Health Promotion*. 1984;1:73-76.
5. Fries JF, Koop CE, Beadle CE, et al. Reducing health care costs by reducing the need and demand for medical services. *N Engl J Med*. 1993;329:321-325.
6. Green LW. *Community Health*. 6th ed. St Louis, Mo: Times Mirror/Mosby Publishers; 1990.
7. Harness B, Pryga E. *Transforming Health Care Delivery: Toward Community Care Networks*. Chicago, Ill: American Hospital Association; 1993.
8. Fielding JE, Halfon N. Where is the health in health system reform? *JAMA*. 1994;272:1292-1296.
9. Kaplan RM. *The Hippocratic Predicament: Affordability, Access, and Accountability in American Medicine*. San Diego, Calif: Academic Press; 1993.
10. Schaffer HH. *Health Promotion and Disease Prevention in Health Care Reform*. Berkeley: School of Public Health, University of California, Berkeley; 1993. Contract report to the California Wellness Foundation.
11. US Dept of Health and Human Services. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*. Washington, DC: US Dept of Health and Human Services; 1991. Publication PHS 91-50212.
12. Winett RA, King AC, Altman DG. *Health Psychology and Public Health: An Integrative Approach*. New York, NY: Pergamon Press; 1989.
13. Green LW, Cargo MD. The changing context of health promotion in the workplace. In: O'Donnell MP, Harris JS, eds. *Health Promotion in the Workplace*. 2nd ed. Albany, NY: Delmar Publishers; 1994:497-524.
14. Weiss SM. Health at work. In: Weiss SM, Fielding JE, Baum A, eds. *Perspectives in Behavioral Medicine: Health at Work*. Hillsdale, NJ: Lawrence Erlbaum Assoc; 1991:1-10.
15. Slomski AJ. How business is flattening health costs. *Med Econ*. July 11, 1994:87-100.
16. O'Donnell MP. Employers' financial perspective on health promotion. In: O'Donnell MP, Harris JS, eds. *Health Promotion in the Workplace*. 2nd ed. Albany, NY: Delmar Publishers; 1994:41-65.
17. Levit K, Cowen C. The burden of health care costs: business, household, government. *Health Care Financing Rev*. 1990;12:131.
18. Walsh J, Francis S. *U.S. Industrial Outlook*. Washington, DC: Health Care Financing Administration, Office of the Actuary, US Dept of Commerce; 1992.
19. Erfurt JC, Foote A, Heirich MA, Brock BM. *Worksite Wellness Programming: How to Do It Effectively*. Bethesda, Md: National Heart Lung and Blood Institute; 1991.
20. US Dept of Health, Education, and Welfare. *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention*. Washington, DC: US Dept of Health Education and Welfare; 1979. Publication PHS 79-55071.
21. Fielding JE, Piserchia PV. Frequency of worksite health promotion activities. *Am J Public Health*. 1989;79:538-542.
22. US Dept of Health and Human Services. 1992 national survey of worksite health promotion activities: summary. *Am J Health Promotion*. 1993;7:452-464.
23. Pelletier KR. A review and analysis of the health and cost-effective outcome studies of comprehensive health promotion and disease prevention programs. *Am J Health Promotion*. 1991;5:311-315.
24. Pelletier KR. A review and analysis of the health and cost-effective outcome studies of comprehensive health promotion and disease prevention programs at the worksite: 1991-1993 update. *Am J Health Promotion*. 1993;8:350-362.
25. Cirksema MK, Flora JA. Audience segmentation in worksite health promotion: a procedure using social marketing concepts. *Health Educ Res*. In press.
26. Erfurt JC, Foote A, Heirich MA. The cost-effectiveness of worksite wellness programs for hypertension control, weight loss, and smoking cessation. *J Occup Med*. 1991;33:962-970.
27. Harvey MR, Whitmer RW, Hilyer JC, Brown KC. The impact of a comprehensive medical benefit cost management program for the city of Birmingham: results at five years. *Am J Health Promotion*. 1993;7:296-303.
28. Fries JF, Fries ST, Parcell CL, Harrington H. Health risk changes with a low-cost individualized health promotion program: effects at up to 30 months. *Am J Health Promotion*. 1992;6:364-371.
29. Fries JF, Harrington H, Edwards R, Kent LA, Richardson N. Randomized controlled trial of cost reductions from a health education program: the California Public Employees' Retirement System (PERS) Study. *Am J Health Promotion*. 1994;8:216-223.
30. Haskell WL, Alderman EL, Fair JM, et al. Effects of intensive multiple risk factor reduction on coronary atherosclerosis and clinical cardiac events in men and women with coronary artery disease: the Stanford Coronary Risk Intervention Project (SCRIP). *Circulation*. 1994;89:975-990.
31. Geller ES. Preventing injuries and deaths from vehicle crashes: encouraging belts and discouraging booze. In: Edwards J, Tindale RS, Heath I, Posavac EJ, eds. *Social Influence Processes and Prevention*. New York, NY: Plenum Press; 1990:249-277.
32. Sofian NS, McAfee T, Doctor J, Carson D. Tobacco control and cessation. In: O'Donnell MP, Harris JS, eds. *Health Promotion in the Workplace*. 2nd ed. Albany, NY: Delmar Publishers; 1994:343-366.
33. Foote A, Erfurt JC. The benefit to cost ratio of worksite blood pressure control programs. *JAMA*. 1991;265:1283-1286.
34. Vernon SW, Gilstrap EL, Jackson GL, Hughes JI. An intervention to increase participation in a work site cancer screening program. *Health Values*. 1992;16:3-9.
35. Fielding JE. The challenges of workplace health promotion. In: Weiss SM, Fielding JE, Baum A, eds. *Perspectives in Behavioral Medicine: Health at Work*. Hillsdale, NJ: Lawrence Erlbaum Assoc; 1991:13-27.
36. Stokols D. Establishing and maintaining healthy environments: toward a social ecology of health promotion. *Am Psychol*. 1992;47:6-22.
37. Dennis C, Houston-Miller N, Schwartz R, et al. Early return to work after uncomplicated myocardial infarction: results of a randomized trial. *JAMA*. 1988;260:214-220.
38. Warner KE. Wellness at the worksite. *Health Aff (Millwood)*. 1990;9:63-79.
39. Schultz EE. Open secrets: medical data gathered by firms can prove less than confidential. *Wall Street J*. May 18, 1994:A1-A5.
40. Ordian DL. Surveillance, monitoring, and screening in occupational health. In: Last JM, Wallace RB, eds. *Public Health and Preventive Medicine*. 13th ed. Norwalk, Conn: Appleton Lange; 1992:551-558.
41. Saal JA, Saal JS. Nonoperative treatment of herniated lumbar intervertebral disc with radiculopathy: an outcome study. *Spine*. 1989;14:431-437.
42. Vickery DM, Iverson DC. Medical self-care and use of the medical care system. In: O'Donnell MP, Harris JS, eds. *Health Promotion in the Workplace*. 2nd ed. Albany, NY: Delmar Publishers; 1994:367-389.
43. Locke S, Kowaloff H, Hoff R, et al. Computer-based interview for screening blood donors for risk of HIV transmission. *JAMA*. 1992;268:1301-1305.
44. Wasson J, Gaudette C, Whaley F, Sauvigne A, Baribeau P, Welch H. Telephone care as a substitute for routine clinic follow-up. *JAMA*. 1992;267:1788-1793.
45. Erfurt JC, Holtyn K. Health promotion in small business: what works and what doesn't work. *J Occup Med*. 1994;33:66-73.
46. Cal/OSHA. *Guide to Developing Your Work-*

- place Injury and Illness Prevention Program, With Checklists for Self-inspection. Sacramento: Cal/OSHA Consultation Service, State of California Dept of Industrial Relations, Division of Occupational Safety and Health; 1991.
47. Vinokur AD, Price RH, Caplan RD. From field experiments to program implementation: assessing the potential outcomes of an experimental intervention program for unemployed persons. *Am J Community Psychol*. 1991;19:543-562.
 48. Conner R. *Preventing AIDS Among Migrant Latino Workers: An Intervention and Model*. Oakland: Office of the President, University of California; 1992. University of California/Health Net Lecture Series.
 49. Minkler MA. *Ethical Challenges for Health Promotion in the 1990s*. Oakland: Office of the President, University of California; 1993. University of California/Health Net Lecture Series.
 50. Perez-Stable EJ, Marin BV, Marin G. *Smoking Cessation Community Interventions for Latinos*. Oakland: Office of the President, University of California; 1991. University of California/Health Net Lecture Series.
 51. Sanders-Phillips K. *A Model for Health Promotion in Ethnic Minority Families*. Oakland: Office of the President, University of California; 1991. University of California/Health Net Lecture Series.
 52. Vaughan E. Chronic exposure to an environmental hazard: risk perceptions and self protective behavior. *Health Psychol*. 1993;12:74-85.
 53. Wallerstein N. Powerlessness, empowerment, and health: implications for health promotion programs. *Am J Health Promotion*. 1992;6:197-205.
 54. Fielding JE, Cumberland WG, Pettitt L. Immunization status of children of employees in a large corporation. *JAMA*. 1994;271:525-530.
 55. US Preventive Service Task Force. *Guide to Clinical Preventive Services: An Assessment of the Effectiveness of 169 Interventions*. Baltimore, Md: Williams & Wilkins; 1989.
 56. Ockene JK, Kristeller J, Pbert L, et al. The physician-delivered smoking intervention project: can short-term interventions produce long-term effects for a general outpatient population? *Health Psychol*. 1994;13:278-281.
 57. Levitt DB. Employee assistance programs. In: O'Donnell MP, Harris JS, eds. *Health Promotion in the Workplace*. 2nd ed. Albany, NY: Delmar Publishers; 1994:423-458.
 58. Rosen R, Berger L. *The Healthy Company: Eight Strategies to Develop People, Productivity, and Profits*. Los Angeles, Calif: JP Tarcher Inc; 1991.
 59. Allen RF, Allen J. A sense of community, a shared vision, and a positive culture: core enabling factors in successful culture based health promotion. *Am J Health Promotion*. 1987;3:40-47.
 60. Blair SN, Piserchia PV, Wilbur CS, Crowder JH. A public health intervention model for worksite health promotion: impact on exercise and physical fitness in a health promotion plan after 24 months. *JAMA*. 1986;255:921-926.
 61. Danko S, Eshelman P, Hedge A. A taxonomy of health, safety, and welfare implications of interior design decisions. *J Interior Design Educ Res*. 1990;16:19-30.
 62. Gottlieb NH, McLeRoy KR. Social health. In: O'Donnell MP, Harris JS, eds. *Health Promotion in the Workplace*. 2nd ed. Albany, NY: Delmar Publishers; 1994:459-493.
 63. Moos RH. Work as a human context. In: Pallak MS, Perloff R, eds. *Psychology and Work: Productivity, Change, and Employment*. Washington, DC: American Psychological Association; 1986:9-52.
 64. O'Donnell MP, Anderson DR. Toward a health promotion research agenda: compilation of database reports and introduction to 'State of the Science' reviews. *Am J Health Promotion*. 1993;8:134-152.
 65. Levi L. Psychosocial, occupational, environmental, and health concepts; research results; and applications. In: Keita GP, Sauter SL, eds. *Work and Well-being: An Agenda for the 1990s*. Washington, DC: American Psychological Association; 1992:199-210.
 66. Bly JL, Jones RC, Richardson JE. Impact of worksite health promotion on health care costs and utilization: evaluation of the Johnson & Johnson Live for Life Program. *JAMA*. 1986;256:3235-3240.
 67. Spilman MA, Goetz A, Schultz J, Bellingham R, Johnson D. Effects of a corporate health promotion program. *J Occup Med*. 1986;28:285-289.
 68. Williams AF. Passive and active measures for controlling disease and injury: the role of health psychologists. *Health Psychol*. 1982;1:399-409.
 69. US Dept of Health and Human Services. *Preventing Homicide in the Workplace*. Cincinnati, Ohio: Centers for Disease Control and Prevention, National Institute of Occupational Safety and Health; 1993. DHHS NIOSH publication 93-109.
 70. State of California, Division of Occupational Safety and Health. *Cal/OSHA Guidelines for Workplace Security*. San Francisco: Dept of Industrial Relations; August 15, 1994.
 71. Brill M, Margulis S, Konar E. *Using Office Design to Increase Productivity*. Buffalo, NY: Workplace Design and Productivity; 1984.
 72. Stokols D, Churchman A, Scharf T, Wright S. Workers' experiences of environmental change and transition at the office. In: Fisher S, Cooper CL, eds. *On the Move: The Psychology of Change and Transition*. Chichester, England: John Wiley Sons Ltd; 1990:231-249.
 73. Smith MJ, Sainfort PC. A balance theory of job design for stress reduction. *Int J Indust Ergonomics*. 1989;4:67-79.
 74. Karasek RA. Job demands, job decision latitude, and job strain: implications for job redesign. *Admin Sci Q*. 1979;24:285-307.
 75. Karasek R, Theorell T, eds. *Healthy Work: Stress, Productivity, and the Reconstruction of Working Life*. New York, NY: Basic Books Inc; 1990.
 76. Jones JW, Boye MW. Job stress and employee counterproductivity. In: Quick JC, Murphy LR, Hurrell JJ Jr, eds. *Stress and Well-being at Work: Assessments and Interventions for Occupational Mental Health*. Washington, DC: American Psychological Association; 1992:239-257.
 77. Maslach C, Jackson SE. The measurement of experienced burnout. *J Occup Behav*. 1981;2:99-113.
 78. Maslach C, Jackson SE. Burnout in organizational settings. *Appl Soc Psychol Annu*. 1984;5:133-153.
 79. Caplan RD, Harrison RV. Person-environment fit theory: some history, recent developments, and future directions. *J Soc Issues*. 1993;49:253-275.
 80. Sauter SL, Hurrell JJ, Cooper CL, eds. *Job Control and Worker Health*. Chichester, England: John Wiley Sons Ltd; 1989.
 81. Maida CA, Gordon NS, Farberow NL. *The Crisis of Competence: Transitional Stress and the Displaced Worker*. New York, NY: Brunner/Mazel Inc; 1989.
 82. Dooley D, Catalano R. Recent research on the psychological effects of unemployment. *J Soc Issues*. 1988;44:1-12.
 83. Liem JH, Liem GR. Understanding the individual and family effects of unemployment. In: Eckenrode J, Gore S, eds. *Stress Between Work and Family*. New York, NY: Plenum Press; 1990:175-204.
 84. Payne R. Becoming and being unemployed. In: Fisher S, Cooper CL, eds. *On the Move: The Psychology of Change and Transition*. Chichester, England: John Wiley Sons Ltd; 1990:251-273.
 85. Bickman L, ed. *Using Program Theory in Evaluation*. San Francisco, Calif: Jossey-Bass Inc; 1987.
 86. Warner KE, Wickizer T, et al. Economic implications of workplace health promotion programs: review of the literature. *J Occup Med*. 1988;30:106-112.
 87. Landy F, Zedeck S, Cleveland J, eds. *Performance Measurement and Theory*. Hillsdale, NJ: Lawrence Erlbaum Assoc; 1983.
 88. Lewin AY, Minton JW. Determining organizational effectiveness: another look, and an agenda for research. *Management Sci*. 1986;32:514-538.
 89. Matteson MT, Ivancevich JM, eds. *Controlling Stress: Effective Human Resource and Management Strategies*. San Francisco, Calif: Jossey-Bass Inc; 1987.
 90. Riley AW, Zaccaro SJ. *Occupational Stress and Organizational Effectiveness*. New York, NY: Praeger Publishers; 1987.
 91. Sundstrom E. *Workplaces: The Psychology of the Physical Environment in Offices and Factories*. New York, NY: Cambridge University Press; 1986.
 92. US Dept of Health and Human Services. *Business Responds to AIDS*. Washington, DC: Public Health Service; 1992.