

Evaluating Primary Care Behavioral Counseling Interventions: An Evidence-based Approach

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Overview

Risky behaviors are a leading cause of preventable morbidity and mortality, yet behavioral counseling interventions to address them are underutilized in health care settings. Research on such interventions has grown steadily, but the systematic review of this research is complicated by wide variations in the organization, content, and delivery of behavioral interventions and the lack of a consistent language and framework to describe these differences. The Counseling and Behavioral Interventions Work Group of the United States Preventive Services Task Force (USPSTF) was convened to address adapting existing USPSTF methods to issues and challenges raised by behavioral counseling intervention topical reviews.

The systematic review of behavioral counseling interventions seeks to establish whether such interventions addressing individual behaviors improve health outcomes. Few studies directly address this question, so evidence addressing

whether changing individual behavior improves health outcomes and whether behavioral counseling interventions in clinical settings help people change those behaviors must be linked. To illustrate this process, we present 2 separate analytic frameworks derived from screening topic tools that we developed to guide USPSTF behavioral topic reviews.

No simple empirically validated model captures the broad range of intervention components across risk behaviors, but the 5 A's construct—assess, advise, agree, assist, and arrange—adapted from tobacco cessation interventions in clinical care provides a workable framework to report behavioral counseling intervention review findings. We illustrate the use of this framework with general findings from recent behavioral counseling intervention studies. Readers are referred to the USPSTF (www.preventiveservices.ahrq.gov or 1-800-358-9295) for systematic evidence reviews and USPSTF recommendations based on these reviews for specific behaviors.

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Epidemiology

In 1998, the Agency for Healthcare Research and Quality (AHRQ) reconvened the USPSTF to update its recommendations for clinical preventive services. This Task Force represents primary care disciplines (nursing, pediatrics, family practice, internal medicine, and obstetrics/gynecology), preventive medicine, and behavioral medicine. Two evidence-based practice centers (EPCs)—Oregon Health & Science University and RTI—University of North Carolina—were contracted to prepare systematic evidence reviews that the USPSTF uses in developing its recommendations for preventive care. Although the USPSTF evidence-based methods are widely applicable throughout medicine, to date they have been used primarily to assess services such as preventive screening, rather than those requiring behavioral counseling.^{1,2} The current USPSTF recognized a 2-fold need: (1) to expand its evidence-based approach to better assess behavioral counseling interventions, and (2) to formulate practical communication strategies for describing services that are effective in changing behavior.

The Counseling and Behavioral Interventions Work Group of the USPSTF adapted the USPSTF generic screening analytic framework, which guides systematic reviews, to address behavioral topics more specifically, and it has promoted a consistent organizational construct for describing behavioral counseling interventions. Clinicians are referred to current products of the USPSTF (www.preventiveservices.ahrq.gov or 1-800-358-9295) for systematic evidence reviews of specific behavioral counseling topics and related USPSTF evidence-based recommendations and clinical considerations beyond the scope of this paper.

This paper has 3 purposes:

- (1) To promote a broader appreciation of the importance of behavioral counseling interventions in clinical care and the context for their delivery.
- (2) To describe the generic analytic frameworks developed to guide the systematic review of behavioral counseling topics for the current USPSTF.
- (3) To detail the practical organizational construct (the 5 A's) adopted by the USPSTF to describe intervention research more consistently in order to foster its application in clinical settings.

Background

Healthy People 2010³ sets 2 major goals for the United States: (1) to increase quality and years of healthy life, and (2) to eliminate health disparities among different segments of the population. The next decade offers unprecedented opportunities for health care systems and providers to address these goals by promoting healthy lifestyles among the diverse populations they serve and by adopting policies that will institutionalize preventive services.

Changing the health behaviors of Americans has the greatest potential of any current approach for decreasing morbidity and mortality and for improving the quality of life across diverse populations.⁴ In their landmark paper, McGinnis and Foege⁵ linked 50% of the mortality in the United States from the 10 leading causes of death to lifestyle-related behaviors such as tobacco use, poor dietary habits and inactivity, alcohol misuse, illicit drug use, and risky sexual practices. These behaviors remain problematic in today's society despite having been previously targeted for improvement.⁶ Thus, the U.S. Department of Health and Human Services has designated 5 lifestyle factors as *Healthy People 2010*³ health indicators by which to track progress in improving the health of the nation over the next decade (Table 1). Improving health behaviors is an important approach to health disparities, because those who are economically and/or socially disadvantaged, including those in low-income ethnic/racial minority groups, disproportionately bear the prevalence of risky health behaviors and the burden of preventable morbidity and mortality.⁷

The unabated impact of health-damaging behaviors among Americans makes it imperative that health care providers and health care systems seriously consider these behavioral issues and accept the challenge of routinely providing quality behavioral counseling interventions where proven effective. The 1996 edition of the *Guide to Clinical*

Table 1. *Healthy People 2010* leading health indicators*

Health indicator	1997 baseline	2010 goals
Tobacco use (%)		
Cigarette smoking adults	24	12
American Indian/Alaskan Native	34	12
Family income, poor level	34	12
Current tobacco use by youth (past 30 days)	43	21
Smoking cessation attempts		
Adults	43	75
Pregnant women	12	30
Adolescents (grades 9-12)	73	84
Overweight and obesity (%)		
Proportion of adults at healthy weight†	42	60
Mexican Americans	30	60
Lower income (< 130% poverty threshold)	29	15
Obesity‡ in adults (≥ 20 years)	23	15
Overweight/obesity in children and teens (6-19 years)§	11	5
Physical activity (%)		
No leisure-time physical activity (≥18 years)	40	20
American Indians/Alaskan Native, African American, or Hispanic	46-54	20
Moderate physical activity		
Adults (≥18 years)	15	30
Adolescents (grades 9-12)	20	30
Substance abuse		
Proportion of adults <u>exceeding</u> low-risk drinking guidelines (%)◇		
Females	72	50
Males	74	50
Alcohol-related auto deaths	6.1/100,000	4/100,000
American Indian or Alaska Native	19.2/100,000	4/100,000
People aged 15-24 years	11.7/100,000	4/100,000
High school seniors never using alcohol (%)	19	29
Binge drinking (%)		
Adolescents (12-17 years)	8.3	3
High school seniors	32	11
College students	39	20
Adults	16	6
Youth (12-17) using marijuana in the last 30 days (%)	9.4	0.7
High school seniors never using illicit drugs (%)	46	56
Responsible sexual behavior (%)		
Unmarried females (18-44 years) whose partners used condoms	23	50
Teens abstain from sex or use condoms	85	95

* Other leading health indicators include mental health, injury and violence, environmental quality, immunizations, and access to health care.

† 18.5 ≥ BMI ≤ 25.

‡ BMI of ≥30.

§ ≥ 95th percentile of gender- and age-specific BMI from year 2000 U.S. growth charts.

|| Moderate activity of 30 minutes a day 5 or more days a week.

◇ Males > 14 drinks/week or > 4 drinks/occasion; females > 7 drinks/week or > 3 drinks/occasion.

Note: BMI indicates body mass index.

Source: From *Healthy People 2010*³ Adapted from public domain document; also available online at <http://www.health.gov/healthypeople>.

Preventive Services by the USPSTF concluded: “Effective interventions that address personal health practices . . . [for] . . . primary prevention . . . hold greater promise for improving overall health than many secondary preventive measures, such as routine screening for early disease. Therefore, clinician counseling that leads to improved personal health practices may be more valuable than conventional clinical activities, such as diagnostic testing.”³¹ Nevertheless, rates of behavioral counseling intervention by pediatricians, nurse practitioners, obstetrician-gynecologists, internists, and family physicians for the priority behaviors discussed above still fall far below national targets.^{3,8,9} In fact, gaps in the delivery of clinical preventive services are greater for behavioral counseling than for screening or chemoprevention.¹⁰ This stems in part from the relative paucity of good research evidence to support the behavioral counseling intervention recommendations in the 1996 *Guide to Clinical Preventive Services*.¹

The quality and quantity of good research evidence for the effectiveness of behavioral counseling interventions are increasing. Brief interventions integrated into routine primary care can effectively address the most common and important risk behaviors.¹¹⁻²² The strongest evidence for the efficacy of primary care behavior-change interventions comes from tobacco cessation research^{11,12,14,15,19} and, to a lesser extent, problem drinking.^{11,16-19,21,22} Accumulating evidence also shows the effectiveness of similar interventions for other behaviors.^{11,19,20} These interventions often provide more than brief clinician advice. Effective interventions typically involve behavioral counseling techniques and use of other resources to assist patients in undertaking advised behavior changes.^{12,19} For example, intervention adjuncts to brief clinician advice may involve a broader set of health care team members (eg, nurses, other office staff, health educators, and pharmacists), a number of complementary communication channels (eg, telephone counseling,^{22,23} video or computer-assisted interventions,²⁴⁻²⁶ self-help guides,²⁷ and tailored mailings²⁸), and multiple contacts with the patient.^{12,14,19,29}

Rationale for Behavioral Counseling Interventions in Clinical Care

Health care providers and their staff play a unique and important role in motivating and assisting patients’ healthy behavior changes. Patients report that primary care clinicians are expected sources of preventive health information and recommendations for patients.³⁰ For instance, in a recent survey, the vast majority (92% to 98%) of adult members of health maintenance organizations (HMO) indicated that they expected advice and help from the health care system in key behaviors, such as diet, exercise, and substance use.³¹ Similarly, health care providers generally accept³² and value their role in motivating health promotion and disease prevention.^{33,34}

Health care systems are natural settings for interventions to improve health behaviors for many individuals because repeated contacts typically occur over a number of years. Interventions to help patients change unhealthy behaviors, like treatments for patients with chronic disease, often require repetition for modest effects over time. Continuity of care offers opportunities to sustain individual motivation, assess progress, provide feedback, and adjust behavior change plans.³⁵

In fact, most clinicians have multiple opportunities to intervene with patients on matters related to health behavior change: patients younger than 15 years average 2.4 visits per person annually to office-based physicians, and those 15 years of age and older average 1.6 to 6.3 visits per year, with visit frequency increasing with age.³⁶ Moreover, 93% of children and youth and 84% of adults 18 years of age and older have a specific source of ongoing health care.³ Not surprisingly, people with a usual source of health care are more likely than those without to receive a variety of clinical preventive services.³

The health care setting is not the only setting for approaches to support healthy behaviors. The *Guide to Community Preventive Services* features evidence-based recommendations from the Task Force on Community Preventive Services for population-based interventions. Those recommendations

include policy or environmental changes or individual and group interventions outside the clinical setting intended to change risky behaviors; reduce specific diseases, injuries and impairments; and address environmental and ecosystem challenges.³⁷ These preventive policies and approaches complement the individually focused interventions that the USPSTF addresses.

Objectives and Scope of Behavioral Counseling Interventions

Behavioral counseling interventions in clinical care are those activities delivered by primary care clinicians and related health care staff to assist patients in adopting, changing, or maintaining behaviors proven to affect health outcomes and health status. Common health-promoting behaviors include smoking cessation, healthy diet, regular physical activity, appropriate alcohol use, and responsible use of contraceptives.

Behavioral counseling interventions occur all or in part during routine primary care and may involve both visit-based and outside intervention components. For instance, assessment of behavioral health risks may occur at the time of enrollment in a health plan or at the time of a clinical visit. Behavioral counseling may take place in routine primary care visits and/or through telephone contacts or personalized mailings of self-help guides or materials. Referral to more intensive clinics in the community also may be included. While the USPSTF primarily evaluates interventions that involve clinicians as part of routine primary care, USPSTF liaisons assigned to a particular behavioral topic define the scope of clinical intervention approaches reviewed for any given topic, such as problem drinking or physical activity.

Behavioral counseling interventions differ from screening interventions in several important ways that affect the ease and likelihood of their being delivered. Behavioral counseling interventions address complex behaviors that are integral to daily living; they vary in intensity and scope from patient to patient; they require repeated action by both

patient and clinicians, modified over time, to achieve health improvement; and they are strongly influenced by multiple contexts (family, peers, worksite, school, and community). Further, “counseling” is a broadly used but imprecise term that covers a wide array of preventive and therapeutic activities, from mental health or marital therapy to the provision of health education and behavior change support. Thus we have chosen to use the term “behavioral counseling interventions” to describe the range of personal counseling and related behavior-change interventions that are effectively employed in primary care to help patients change health-related behaviors. As with its use in other contexts, “counseling” here denotes a cooperative mode of work demanding active participation from both patient and clinician that aims to facilitate the patient’s independent initiative and ability to cope.³⁸ Engaging patients actively in the self-management practices needed to change and maintain healthy behaviors is a central component of effective behavioral counseling interventions.

Theories and Models of Behavior Change

Behavior change theories and models from the social and behavioral sciences explain the biological, cognitive, behavioral, and psychosocial/environmental determinants of health-related behaviors. Thus they also define interventions to produce changes in knowledge, attitudes, motivations, self-confidence, skills, and social supports required for behavior change and maintenance.³⁹ The application of relevant theoretical models to behavioral counseling interventions is an important contribution to strengthening health research in this area.⁴⁰ A literature review of 1,174 articles evaluating health behavior, education, and promotion interventions published between 1992 and 1994 found that 44.8% of these were explicitly theory based.⁴¹ Six theories and models addressing determinants of health-behavior change at the intrapersonal, interpersonal, and environmental levels (Table 2) and 2 cross-theoretical key constructs/theories were most commonly cited in this research. Promising, if not substantial, empirical evidence supports the

Table 2. Six most commonly cited behavior change models, theories, and constructs—focus and key concepts

Level addressed	Theory/model	Focus	Key concepts
Theories that address how individual factors such as knowledge, attitudes, beliefs, prior experience, and personality influence behavioral choices	Health belief model	Peoples' perceptions of the threat of a health problem and appraisal of behavior recommended to prevent or manage problem	Perceived susceptibility Perceived severity Perceived benefits of action Perceived barriers to action Cues to action Self-efficacy
	Theory of reasoned action/theory of planned behavior	People are rational beings whose intention to perform a behavior strongly relates to its actual performance through beliefs, attitudes, subjective norms, and perceived behavioral control	Behavioral intention Subjective norms Attitudes Perceived behavioral control
	Stages of change/ transtheoretical model	Readiness to change or attempt to change a health behavior varies among individuals and within an individual over time. Relapse is a common occurrence and part of the normal process of change.	Precontemplation Contemplation Preparation Action Maintenance Relapse
Theories that address processes between the individual and primary groups that provide social identity, support, and role definition	Social cognitive theory/social learning theory	Behavior is explained by dynamic interaction among personal factors, environmental influences, and behavior	Observational learning Reciprocal determinism Outcome expectancy Behavioral capacity Self-efficacy Reinforcement
	Community organization/building	Processes by which community groups are helped to identify and address common problems or goals	Participation and relevance Empowerment Community competence issue selection
	Social marketing	The application of commercial marketing technologies to increase the practice of healthy behaviors in order to improve individual and collective well-being	Consumer orientation Audience segmentation Communication channels analysis Voluntary exchange of goods and services

validity of all 8 theories in predicting or changing health behavior.⁴¹ In addition to those listed in Table 2, self-efficacy and social network/support were the other 2 most commonly cited constructs in the current literature. Self-efficacy is an individual's level of confidence in his or her own skills and persistence to accomplish a desired goal and predicts future behavior across a wide variety of lifestyle risk factors.⁴² Social networks are a person-centered web of social relationships.⁴³ These relationships provide social support that can assist the individual through "stress-buffering" and other mechanisms.⁴³

These theories focus on diverse, interacting levels of influence on an individual's behavior. On the intrapersonal level, multiple internal factors influence an individual's behavioral choices and actions, and there is considerable variability in these factors among individuals with the same objective health behavior. For example, in the stages-of-change/trans-theoretical model (Table 2), behavioral change is thought of as an ongoing process with multiple stages that often includes relapse and recycling into renewed efforts to change.⁴⁴ On the interpersonal level, individual behavioral choices occur in a context that includes the influence of social and environmental conditions in the family and larger community.^{41,45}

Behavioral influences operate within a broadly conceptualized ecological paradigm emphasizing that a dynamic interaction between functional levels— intrapersonal, interpersonal, and the physical environment—continues over an individual's lifetime, and that age, gender, race, ethnicity, and socioeconomic status play a critical role in health and health decisions.^{40,46} Similarly, the Institute of Medicine⁴⁷ recently concluded that "interventions must recognize that people live in social, political, and economic systems that shape behaviors and access to the resources they need to maintain good health."

According to another recent Institute of Medicine report,⁴⁰ there is an emerging consensus that social and behavioral research and intervention efforts should be based on this broader ecologic model that incorporates and relates focused approaches across levels. Thus, omission of any key dimension in

research or practice reduces the likelihood of successfully addressing problem behaviors, such as smoking.⁴⁸ More than a brief overview of theories and models is beyond the scope of this paper and can be found elsewhere.³⁹⁻⁴⁶

Although these theoretical constructs are unfamiliar to many clinicians, they can help practitioners conceptualize the complex context in which individual behavioral choice occurs and the variability among patients in their receptivity to behavioral counseling interventions at any one time. These insights can clarify barriers, opportunities, and the relative intensity of intervention needed to successfully address behavior change for a given individual.

Generally speaking, less-intensive outside support and intervention are needed for individuals with more change-predisposing attributes than for those with fewer such attributes^{48,49} (Table 3). Scarce resources can be focused on strengthening an individual's factors favoring change and targeting the most intensive support to people with the fewest pre-disposing attributes. Theoretical perspectives also make clear the complementary role played by policies and practices in settings outside health care in promoting healthy behaviors across society.

The Clinician-Patient Relationship

As our understanding of behavioral counseling interventions has become more sophisticated, interventions have evolved beyond the limits of one-on-one interactions between a clinician and a patient. However, the use of additional resources within and outside the primary care setting to support the clinician by no means undermines the importance of the clinician-patient relationship in promoting behavior change. Effective clinician communication is important for a variety of patient outcomes.^{50,51} Clinician advice to change lifestyle habits is associated with increased efforts to change^{52,53} and is effective in encouraging smoking cessation,^{11,12,14,15} reducing problem drinking,^{11,16} and modifying some activity- and diet-associated cardiovascular risk factors.^{11,20} Clinician advice is also

Table 3: Attributes from health behavior change theories and models that predispose an individual to successful behavior change: ^{39,45,49}

1. Strongly wants and intends to change for clear, personal reasons.
2. Faces a minimum of obstacles (information processing, physical, logistical, or environmental barriers) to change.
3. Has the requisite skills and self-confidence to make a change.
4. Feels positively about the change and believes it will result in meaningful benefit(s).
5. Perceives the change as congruent with his/her self-image and social group(s) norms.
6. Receives reminders, encouragement, and support to change at appropriate times and places from valued persons and community sources, and is in a largely supportive community/environment for the change.

associated with increased satisfaction with medical care.^{30,54,55} Such advice has been suggested to “prime” patients, especially women, to attend to and act on subsequent educational information.⁵⁶ In a recent cross-sectional study among members of a managed care organization,⁵⁷ receipt of professional advice to change was associated with a higher readiness to change smoking, physical activity, and diet behaviors. Preliminary data also suggest that advice from one’s health care provider based on personal health status is a very strong external cue to health-promoting action.⁵⁸

The clinician employing an empathetic “partnership” approach avoids engendering resistance to behavior change advice.⁵⁹ Such an approach emphasizes the patient’s role in interpreting advice and explores, rather than prescribes, how best to proceed. According to a Toronto consensus conference on doctor-patient communication,⁶⁰ “effective communication between doctor and patient is a central function that cannot be delegated.”

The Potential Impact of Health Behavior-Change Programs in Clinical Care

Appreciating behavioral counseling interventions requires a true population-based medicine perspective (ie, intervening with individuals, but recognizing that the health benefits may not be as clinically visible individually as they are clinically meaningful when considered for the whole).

Individually, brief behavioral counseling interventions that are feasible in health care settings often have only modest behavior change impacts. For example, only 5% to 15% of those receiving an intervention make clinically significant changes, such as quitting smoking¹² or reducing heavy drinking.¹¹ Even at a population level, overall risk factors typically change only 1% to 20%.^{16,17,19,20,22,61} However, these “modest” impacts translate to significant benefits to the health of the population (and to multiple individuals) when systematically applied to a large proportion of those in need.^{48,62-65} This opportunity for substantial public health benefit comes about only when behavior change interventions are applied broadly to entire populations of patients. Given this, population-based behavioral interventions generally offer a range of intervention options including motivational strategies designed for people not ready to change⁶⁴ (see sidebar, “Impact of Health Behavior Change Programs”).

Impact of Health Behavior Change Programs

Highly efficacious, intensive group tobacco cessation approaches^{12,48,64,66} have typically been perceived as producing higher quit rates than primary care behavioral counseling interventions. Group approaches produce quit rates of 30% to 40% but reach only a small proportion of highly motivated smokers volunteering for treatment (roughly 3% to 5% of all smokers). Thus, their potential impact on the prevalence of smoking (Impact = Participation Rate x Efficacy) is substantially less than systematically delivered primary care interventions, which can feasibly reach the 70% of smokers who

Continued on page M-55

Impact of Health Behavior Change Programs (continued)

visit their clinicians each year and result in 5% to 10% overall quit rates.

Applying a similar public health approach, modest effective clinical interventions addressing problem drinking^{21,22,62} and dietary change⁶¹ are projected to have significant population impact when broadly delivered.

Practical Approaches to Overcome Barriers to Behavioral and Counseling Interventions

Numerous barriers to preventive service delivery continue to exist in present-day health care settings, most of which are still organized mainly around symptom-driven, acute illness care.^{67,68} These barriers include a focus on more medically urgent issues; lack of time; inadequate clinician training, self-confidence, or reimbursement; low patient demand; and lack of supportive resources.^{3,69} Further, feedback to clinicians about results of preventive care is largely non-existent or can even be negative.⁶⁹ For example, clinicians or their staffs may never “hear” about the patients who followed through on a referral or made positive lifestyle changes, but may encounter complaints about repeated advice to quit smoking, even when voiced by only a few.

Unfortunately, most of these challenges are exacerbated for health behavior-change interventions. Thus, risk assessment and behavioral counseling interventions are delivered even less frequently than screenings.⁸ Moreover, although clinicians increasingly agree that most health-promoting behaviors are important to patients’ health,³² they report skepticism about patients’ willingness to change these behaviors and about their own ability to intervene successfully in these areas.^{70,71} Clinicians often lack the knowledge, skills, and support systems to quickly and easily provide a range of different behavioral counseling interventions, particularly in the limited time

available.^{69,72,73} These barriers provide an important rationale for proposing a consistent overall approach (such as the 5 A’s, discussed below) for describing behavioral counseling interventions across the range of topics in clinical care.

Evaluations of continuing medical education efforts show that programs based on the principles of adult learning that build clinician skills using interactive, sequential learning opportunities in settings such as workshops, small groups, and individual training sessions appear to have the greatest influence on clinician practices and patient outcomes.⁷⁴ Even relatively brief physician training along these lines (2 to 3 hours) can improve the delivery of clinical preventive services.^{75,76}

However, clinician training may be efficacious only in the presence of an office-support program that assists clinicians in carrying out behavioral counseling interventions and incorporating them into routine care.^{77,78} As Solberg et al⁷⁹ has noted, “Without such systems, delivery of preventive services must depend on the memory, motivation, and time of individual clinicians.” Fortunately, we also have a better understanding of the organized office or health-plan processes that support the systematic and consistent delivery of clinical preventive services. These systems typically consist of (1) preventive services guidelines; (2) basic support processes that identify and activate those who need a service, summarize needed services on the patient chart, and remind the clinician during a visit; and (3) prevention resources to provide in-clinic and after-clinic counseling, support, and follow-up.⁸⁰ A recent randomized controlled trial⁸¹ reported that, compared with control practices, community family practices demonstrated significantly increased clinical preventive services delivery 1 year after receiving practice-tailored systems support for preventive service delivery. Delivery of behavioral counseling interventions was particularly improved. The Put Prevention Into Practice (PPIP) program, sponsored by AHRQ, has a variety of materials to help make these services an integral part of primary care. PPIP has developed tools to assist clinicians in determining which clinical preventive services patients should receive,

and it produces guides and materials for service delivery in a variety of settings.⁸² PPIP also provides resources for patients to guide health maintenance decisions and to keep track of their preventive care.

Ongoing innovations in the design and delivery of behavioral counseling interventions can also address barriers, improve patient access, and increase treatment effectiveness. Clinicians' efforts are enhanced when the entire health care team takes appropriate and complementary roles in delivering efficacious interventions.^{29,83,84} For example, health educators and nurse case managers who contact and support smokers between visits⁸⁵ extend intervention opportunities beyond the initial primary care visit. Coordination with resources outside the clinical setting, such as programs and services through voluntary agencies and other community resources, can help patients conveniently access needed supports after they leave the visit.⁶⁷ This integration may increase health care system efficiency and impact by creating congruence between clinical interventions and the broader community.⁸⁶ Expanding communication technologies allow both passive and interactive use²⁵ of telephones, videos, CD-ROMs, the Internet, and other computer-assisted venues to enhance and personalize behavioral intervention content^{28,87} and to prolong contact with the patient, while reducing the services that must be directly provided by clinical staff.⁶⁷ Such computer-based print, telephone, and video communications have boosted treatment outcomes over standard "one-size-fits-all" interventions in several behavioral areas (eg, smoking cessation and diet modification), with greatest benefits sometimes seen in low-income populations.⁸⁸⁻⁹⁰ Although some of these technologies are relatively new and still under evaluation, advances in information and communication technologies hold great promise for enhancing intervention efficiency by automating assessment, education, and patient contacts, especially for ongoing follow-up and support. Taken together, these ongoing innovations offer opportunities to address key barriers to behavioral counseling interventions in clinical settings.

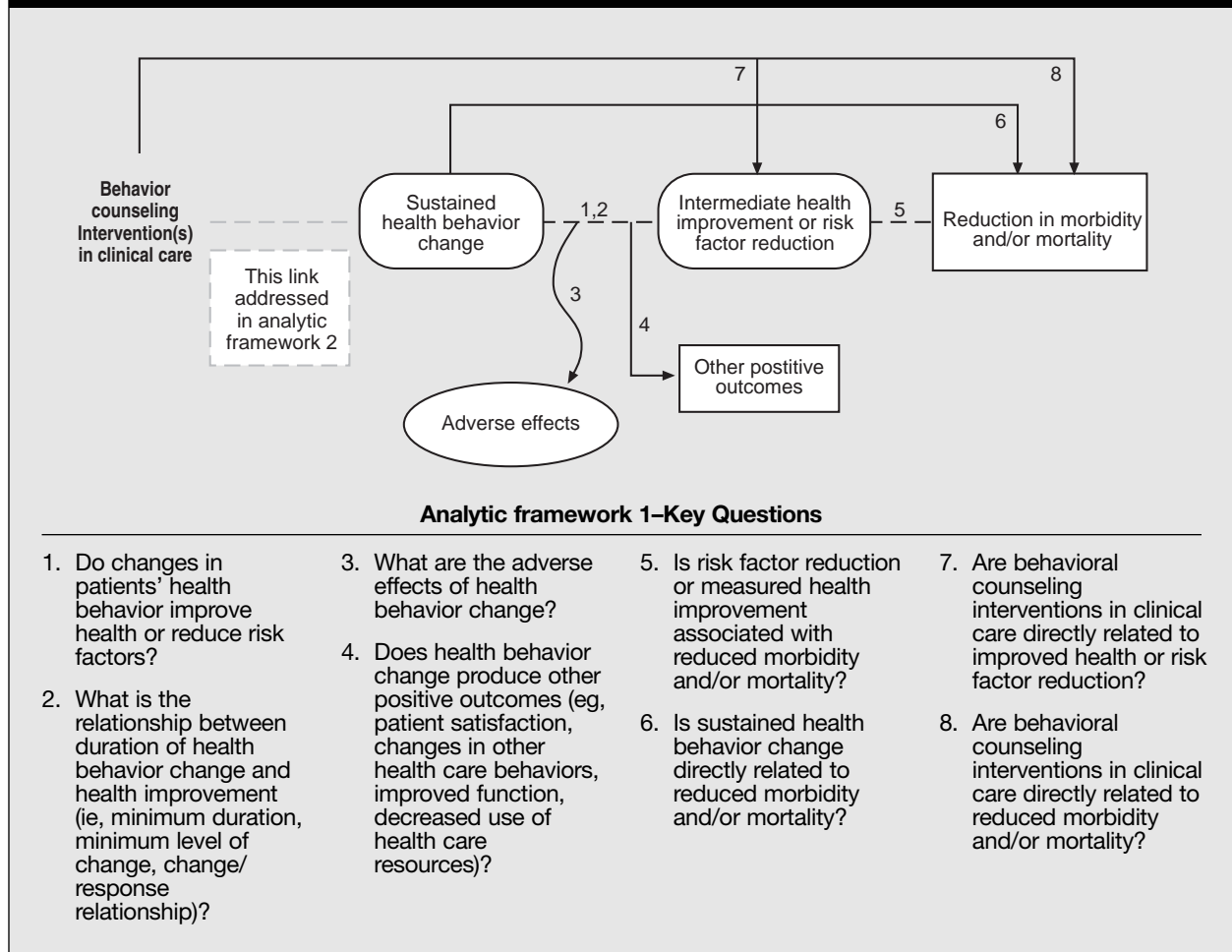
Evidence-Based Methods for Evaluating Behavioral Counseling Interventions

We developed 2 interrelated generic analytic frameworks to guide the systematic review of behavioral topics (Figures 1 and 2). These analytic frameworks were derived from those developed for screening topics.² They separately frame the 2 main questions to consider when systematically reviewing relevant clinical behavioral intervention research, namely: (1) Does changing individual health behavior improve health outcomes? (Figure 1) and (2) Can interventions in the clinical setting influence people to change their behavior? (Figure 2). More in-depth key questions (KQs) for each main question are detailed in the text notes on each analytic framework diagram, and the relevant sections of the diagram are numbered to correspond to these key questions.

Analytic Framework 1: Does Changing Individual Health Behavior Improve Health Outcomes?

Clinical interventions are predicated on a foundation of epidemiological research that adequately substantiates the link between particular behaviors and health outcomes,² as depicted in Figure 1 (Analytic Framework 1, KQs 1, 2, 5). For instance, there is strong consistent evidence that tobacco use, sedentary lifestyle, and improper diet lead to negative clinical and functional health outcomes,¹ and, conversely, that smoking cessation, exercise improvement, and dietary improvement lead to positive clinical and functional health outcomes. However, few behavior change intervention studies actually document long-term health outcomes (KQ 8). Therefore, we usually must rely on linking up separate bodies of evidence (represented here by the 2 interrelated but separate analytic frameworks) to demonstrate whether clinical interventions improve health behaviors and lead to better health outcomes.

**Figure 1. Does changing individual health behavior improve health outcomes?
Analytic framework 1**

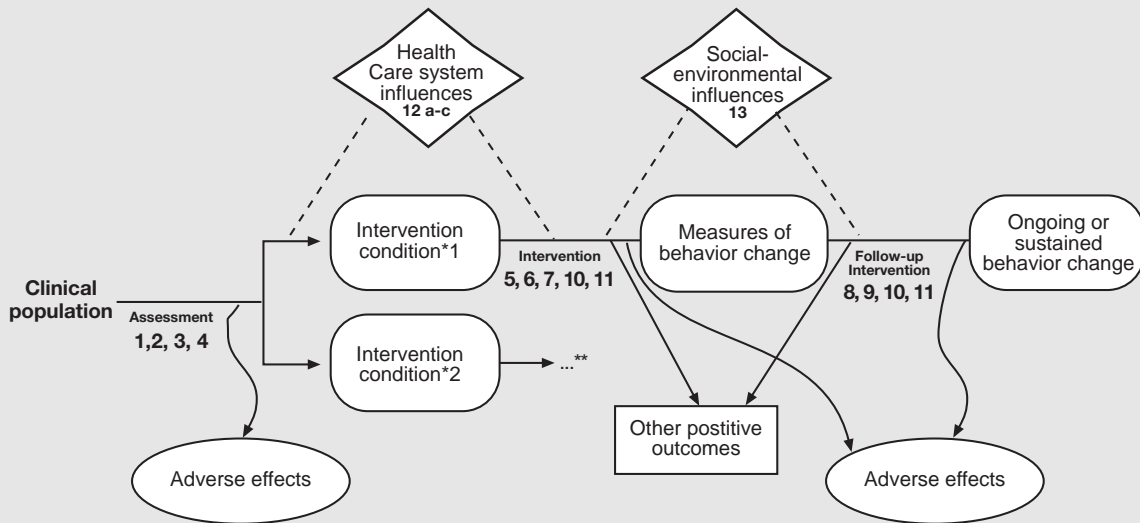


The USPSTF may elect to summarize, but not systemically review, the evidence supporting the link between health-behavior change and outcomes (shown here in Analytic Framework 1) when either: (1) the evidence has been reviewed in a previous USPSTF report and addresses all issues of current concern, or (2) a good-quality systematic review conducted by another reputable body is available that meets USPSTF standards for grading evidence and addresses the behaviors and outcomes that the USPSTF is interested in. In such instances, Analytic Framework 1 may be dispensed with altogether and attention focused on the literature addressing interventions to effect the desired behavior change (discussed below under Analytic Framework 2).

However, even when an evidence review does not

formally undertake the key questions in Analytic Framework 1, the epidemiologic evidence linking health behavior change to health benefits illustrated in this diagram can help define appropriate behavior-change outcome measures for the systematic review of behavioral counseling interventions represented by Analytic Framework 2 (Figure 2). Ideally, behavior-change outcome measures of interest in a particular behavioral review are defined as those related epidemiologically to reductions in morbidity and mortality directly (KQ 6) or through intermediate outcomes (KQs 2 and 5 linked together). For behaviors such as improper diet and insufficient physical activity, intermediate outcomes may include physiological risk factors, such as blood pressure, weight, and cholesterol level,

**Figure 2. Can interventions in the clinical setting influence people to change their behavior?
Analytic framework 2**



Analytic framework 2–Key Questions

- | | | | |
|--|--|--|---|
| <ol style="list-style-type: none"> 1. Are there distinct patient groups for whom different assessment and behavioral counseling intervention strategies apply? 2. What patient characteristics (eg, sociodemographics—including age, race/ethnicity, gender—health status, risk status, behavioral habits, and interest in benefits and barriers to change) are critical to assess prior to behavioral counseling intervention? 3. What are valid, reliable, feasible, and accessible tools for behavioral assessment of patients (and family, as appropriate)? 4. What are adverse effects associated with behavioral assessment? 5. Do behavioral counseling interventions alter health behavior in the targeted group? | <ol style="list-style-type: none"> 6. What are the essential elements of efficacious interventions (ie, what, how, when, where, to whom, by whom, for how often, and for how long)? 7. Are behavioral counseling interventions particularly effective or ineffective in patient subgroups? 8. How long are targeted behavior changes maintained after behavioral counseling intervention? 9. What type of ongoing assistance or support is needed to achieve or maintain targeted behavior changes? 10. Do behavioral counseling interventions produce other positive outcomes (eg, mediators of behavior change, changes in other health behaviors, and improvements in functioning)? 11. What are adverse effects associated | <p>with behavioral counseling intervention?</p> <ol style="list-style-type: none"> 12. Which of the following systems influences facilitate/impede behavioral assessment and/or intervention? <ol style="list-style-type: none"> a. Features of the health care team: attitude/motivation, professional discipline(s), skills/training; b. Features of the practice setting: practice size and patient makeup, workforce mix, incentives, resources, office support systems, materials; c. Features of the health care system: type of organization, location, population characteristics, density, organizational characteristics/policies, administrative arrangement, decision support tools, clinical | <p>information systems, incentives, market conditions, community resources, political/legal/regulatory issues, accreditation issues.</p> <ol style="list-style-type: none"> 13. What are the larger social/environmental influences that determine whether individuals respond to appropriate behavioral counseling interventions and successfully change targeted health behaviors? |
|--|--|--|---|
- *An intervention condition is a distinct patient sub-group identified through the assessment process that receives a particular intervention as part of their clinical encounter.

**Evidence for each intervention condition is reviewed in parallel.

through which reductions in morbidity and /or mortality are mediated. In reality, the preferred outcome measures may not be widely available in the literature, because behavioral outcome definitions often vary widely among studies. Sustained behavior changes potentially affect other outcomes of importance to the patient (changes in other behaviors or quality of life) or to the health care system (utilization or patient satisfaction) (KQ 4), and may also induce adverse effects, such as increased injury rates in those increasing physical activity (KQ 3).

As new epidemiologic evidence becomes available, the behavioral outcomes of interest to reviewers may also shift. For tobacco, illicit drug, and alcohol misuse, abstinence has been the primary treatment goal and the most important behavioral outcome. Recently, increased attention has been paid to the health benefits from reducing smoking,⁹¹ increasing safe needle use in intravenous drug users,⁹² and stressing moderation in alcohol use.⁹³ Thus, future reviews may include interventions addressing such behavioral outcomes.

Analytic Framework 2: Can Interventions in the Clinical Setting Influence People to Change Their Behavior?

Once a behavior change has been clearly related epidemiologically to improved health outcomes, the most critical issue for clinicians is knowing whether interventions in the clinical setting help patients change their behavior and, if so, how to deliver them effectively and practically. Analytic Framework 2 (Figure 2) contains the logic and critical questions to systematically evaluate the evidence for recommending specific strategies in clinical care to promote healthy behaviors.

Earlier USPSTF experience suggested the need for studies that develop and validate risk-screening and intervention-assessment tools and that examine the efficacy or effectiveness of interventions based on these assessments.⁹⁴ Assessment (KQ 3) specifies how best to identify patients in need of behavioral intervention and to measure quickly any key characteristics by which the intervention should be

individualized (KQ 1, 2). Assessment itself may have adverse effects, such as anxiety, misdiagnosis, or distraction from appropriate care, which would detract from any overall benefit (KQ 4) (see sidebar, “Physical Activity Interventions”).

Physical Activity Interventions

Using physical activity as an example, the majority of adults may be sedentary, but not all who visit the clinician need an exercise intervention, and there is no way to determine the need for activity counseling without a specific assessment. In a recent study, fully half of older adults in community-based medical practices who were willing to receive exercise counseling were already active enough not to need further encouragement.⁹⁵ Activity assessments include standard questions about the frequency, duration, and intensity of physical activity, as well as medical factors that would dictate the exercise type or regimen to prevent harms or complications. Exercise assessment is often individualized further to address motives, barriers, and supports for increasing activity levels. The efficacy of exercise interventions appears to be enhanced when varied according to factors such as the patient’s readiness to change, exercise preferences, or past experiences.⁹⁶

The next arrow or link in Analytic Framework 2 examines whether clinical setting interventions are effective in changing behavior (KQ 5) and specifying for whom (KQ 7). For behavioral counseling interventions, no less than for other primary care treatment regimens, it is critical to know intervention details⁹⁷ (KQ 6): What were the key elements of the intervention, and to whom were they delivered? How were they delivered—when, where, and by whom? What were the time and intensity of the intervention contact? How often and over what time period was the intervention delivered? What was the total intervention “dosage” in terms of frequency, intensity and duration? What were the extent and the duration of the treatment effect (KQ 8)?

Many successful interventions provide repeated contacts and supports that can be modified to fit the individual path of change undertaken by the patient (KQ 9). The USPSTF also considers other benefits (KQ 10) or potential harms (KQ 11) associated with the behavior change. Evaluation of intervention

processes as well as content determines the extent, fidelity, and quality of intervention implementation.⁴⁷

Finally, the review can consider how characteristics of the health care setting influence the likelihood that appropriate individuals will be identified and will receive behavioral interventions (KQ 12a-c), and how larger sociocultural environmental forces influence individuals' ability to change their behavior (KQ 13).⁹⁸⁻¹⁰¹ Since individuals are embedded within social, political, and economic systems that shape their behaviors and constrain their access to resources for change, it is important to incorporate these broader factors into our evaluation of interventions.⁴⁷

To gain the maximum benefit from interventions in clinical settings, we need to extend our perspective beyond efficacy (ie, it works in research settings) or even effectiveness (it works in real-world clinical settings) to consider the degree to which tested interventions are feasible for adoption into those real-world clinical settings and sustainable over long periods of time.^{31,63} These perspectives are critical to realizing the public health benefits of modest clinical interventions.

Aligning Evidence With Usefulness in Clinical Settings

Evidence-based analyses help define the most effective and efficient interventions for specific risk behaviors. Unfortunately, the state of the evidence for behavioral counseling interventions precludes a simple, consistent approach to conducting and reporting the results of these evidence reviews, particularly across a variety of behaviors. Lack of detail and inconsistency of terms describing behavioral interventions in published reports seriously hamper rigorous reviews and limit the potential for research replication. Similarly, methodologic approaches to these topics are evolving as we consider whether and how special methodologic considerations apply regarding adequacy of research design or unique threats to internal and external validity when evaluating behavioral counseling interventions. These issues are important to understand, particularly given the gap between available behavioral research and current

standards of high-level evidence developed for other fields of medicine.⁴⁷ However, under the best of circumstances, it remains to be seen how far we can go in specifying standardized approaches for clinicians to the variety of patients for a variety of behaviors. There may be a limit as to how well we will ultimately be able to define any standardized approach, given the multiplicity of factors (patient, family, community, clinician, and health care setting) influencing behavioral change, and the range of states within each factor. This is an important area for ongoing research.

Thus, the current literature, while much improved over the past, may still be insufficient to unequivocally define for the clinician what does and does not work across all primary care behavioral counseling interventions. However, given the prevalence and health impact of unhealthy behaviors, clinicians may still use the time and resources readily available to them to reinforce the importance of healthy behaviors with their patients. For detailed evidence-based consideration of behavioral counseling interventions for specific behaviors, readers are referred to the USPSTF recommendations (and associated systematic reviews).¹⁰²

Given the inconsistencies in terms and intervention descriptions in the current behavioral counseling intervention literature, the USPSTF decided to use a unifying construct to describe these interventions more consistently across a range of approaches and behaviors. The USPSTF also recognized the need to contribute to the development of a new conceptual and linguistic synthesis for health behavioral counseling interventions in clinical care. Given that no single empirically validated model captures the broad range of interventions across risk behaviors, the USPSTF chose to adopt the 5 A's construct because it was judged to have the highest degree of empirical support for each of its elements and because of its use in the existing literature. We describe and then illustrate the use of this construct in the next section of the paper, which also updates the 1996 USPSTF summary of the range of research-supported strategies for clinicians interested in delivering behavioral counseling intervention in clinical care.¹

The 5 A's Organizational Construct for Clinical Counseling

Background

The 4 A's construct (ask, advise, assist, arrange) was originally developed by the National Cancer Institute to guide physician intervention in smoking cessation.¹⁰³ Recently, the Canadian Task Force on Preventive Health Care proposed that clinicians use a 5 A's construct (adding an agree step) to organize their general approach to assisting patients with behavioral counseling issues (W.Elford, Canadian Task Force on Preventive Health Care, personal communication, December 2000). The U.S. Public Health Service¹² used the A's construct to report on high-quality, controlled clinical trials in tobacco cessation, many conducted in primary care settings to test brief, feasible population-level interventions. The A's construct has also been applied to brief primary care interventions for a variety of other behaviors.^{70,75,95}

To be congruent with the U.S. Public Health Service and Canadian Task Force concepts of the A's construct, we adopted the following terminology to describe minimal contact interventions that are provided by a variety of clinical staff in primary care settings:

- Assess:** Ask about/assess behavioral health risk(s) and factors affecting choice of behavior change goals/methods.
- Advise:** Give clear, specific, and personalized behavior change advice, including information about personal health harms/benefits.
- Agree:** Collaboratively select appropriate treatment goals and methods based on the patient's interest in and willingness to change the behavior.
- Assist:** Using behavior change techniques (self-help and/or counseling), aid the patient in achieving agreed-upon goals by acquiring the skills, confidence, and social/environmental supports for behavior

change, supplemented with adjunctive medical treatments when appropriate (eg, pharmacotherapy for tobacco dependence, contraceptive drugs/devices).

- Arrange:** Schedule follow-up contacts (in person or by telephone) to provide ongoing assistance/support and to adjust the treatment plan as needed, including referral to more intensive or specialized treatment.

Rationale and Strategies for Implementing the 5 A's

The content of each step in the 5 A's construct necessarily varies from behavior to behavior, but clinical intervention targeting any behavior change can be described with reference to these 5 intervention components. While we promote the idea of a unifying construct to describe behavioral counseling interventions across behaviors, we acknowledge that the type and intensity of behavior change strategies needed may vary by the complexity of the change, whether the behavior is being added or deleted, and by factors individual to the patient, as described in the "Theories and Models of Behavior Change" section above. Our brief description of each "A" of this unifying construct uses selected examples from recent research to detail current options and challenges in providing behavioral counseling interventions in clinical care.

Assess

Because behavioral risks are largely invisible and are rarely the main reason for seeking clinical care, explicit systems for behavioral risk-factor assessment in clinical populations serve 2 purposes. First, they identify all those in need of some intervention for a given behavior (eg, sedentary or underactive individuals vs already active).⁹⁶ Second, they gather data needed to target (group) those needing different interventions and, if warranted, to individualize (tailor) brief interventions for maximum effectiveness or health benefit.¹⁰⁴

Depending on the behavior, groups are targeted for intervention by factors such as current practices (eg, current tobacco users vs recent quitters),¹²

intention (eg, intending to breast-feed vs not),¹⁰⁵ readiness to change the behavior (eg, soon vs not),¹⁰⁶ and presence of medical/physiological factors defining treatment options (eg, pregnant vs not). Within target groups, moderating factors such as age,¹⁰⁷ gender,¹⁰⁸ ethnicity,¹⁰⁹ comorbidity, or health literacy¹¹⁰ can help clinicians individualize (tailor) intervention emphasis¹⁰⁴ once such tailoring has been proven beneficial. Such assessment for intervention individualization may be delayed to a later point in the A's process¹² (see "Agree" section below). Assessment can also identify contraindications to intervention, such as general promotion of physical activity in the presence of recent morbidity⁹⁶ or the safety and appropriateness of nicotine replacement therapy as a behavioral treatment adjunct.¹²

Systematic, routine assessment is the foundation for proactive behavioral counseling interventions, particularly to realize their public health potential. For instance, having a system in place to identify and document tobacco-use status triples the odds of clinician intervention.¹² Adequate assessment can help the clinician consider patient priorities and medical risks, particularly among those with multiple behavioral risks.¹¹¹ Little research currently exists in effective methods for prioritizing among competing behavioral risks, but ongoing work by the Behavior Change Consortium, sponsored by the National Institutes of Health, may help address these issues¹¹² (see sidebar, "Assesment Strategies").

Assessment Strategies

Ideal assessment strategies for clinical practice settings are feasible, brief, and able to be interpreted or scored easily and accurately, and they enhance intervention appropriateness and effectiveness.^{113,114} Assessment ranges from a few focused questions added before the clinician visit ("Have you used tobacco products at all in the last 7 days? If yes, are you seriously thinking about quitting in the next 6 months? If no, have you used them in the last 6 months?"¹¹⁵) to more comprehensive tools, such as health risk appraisal (HRA). An HRA is a multi-page questionnaire that collects patient information to identify risk factors and is typically used to produce an individualized feedback report to promote health,

Continued

Assessment Strategies (continued)

sustain function, and prevent disease. HRA feedback, alone or in combination with single-session counseling by a clinician, is generally ineffective in producing behavior change,¹¹¹ but the HRA can be a low-cost, easy method to gather data systematically about a variety of modifiable health behaviors and related factors.

Challenges for behavioral assessments include the tension between accuracy and feasibility.¹¹⁶ To be practical, many tools are abbreviated to require as little patient and clinician time as possible; thus, good evaluations consider both accuracy and applicability for any assessment approach. Most behaviors besides tobacco use—such as poor diet, physical inactivity, or risky sex—are complex to assess because clinicians need some details of usual practices, such as the frequency, intensity, and duration of various physical activities⁹⁶ or "usual" intake of specific food items, both to identify individual candidates for intervention and to measure their progress.^{116,117} One approach to the demands of a more lengthy assessment is to obtain brief assessment by telephone in advance of the clinic visit.^{95,117} This has been shown to produce reasonably accurate results, at least for physical activity.¹¹⁸ Assessments rely on self-report and recall of customary behavior, and these can suffer from lapses in individual memory, errors in estimation, and the imprecise mapping of self-reported activities to meaningful, physiologically related measures.¹¹⁶ Overall, when reliable biological or biomechanical markers are available for comparison, self-reported health behaviors and risk factors tend to underestimate the proportion of general-population individuals considered "at risk."¹¹³ Accuracy and self-disclosure are enhanced by selecting assessment tools designed to maximize the accuracy of self-report information.¹¹³

Advise

As discussed above, clinician advice establishes behavioral issues as an important part of health care and enhances the patient's motivation to change. Such advice is most powerful when personalized by specifically linking the behavior change to the patient's health concerns, past experiences, family, or social situation,¹¹⁹ and tempering it with the individual's level of health literacy.¹²⁰ Clinician advice primarily gives the cue to action, while other

health professionals and media provide the details.^{29,56} In this scenario, the clinician is a uniquely influential catalyst for patient behavior change⁶⁹ and is best supported by a coordinated system to accomplish and maintain that change.

Feedback from current or previous assessments can help personalize health risks and health benefits as well as enhance motivation for change.⁵⁹ Well-delivered advice supports the patient's self-determination.¹²¹ Using minor qualifications such as, "As your physician, I feel I should tell you," for an advice message, rather than "You should," is a subtle but powerful way to convey respect for, and avoid undermining, patient autonomy (see sidebar, "Advice Strategies").

Advice Strategies

Effective clinician advice has several important elements. Personalized feedback can be biological (laboratory or physiological test results), normative (compared with results for others of the same age, race, and gender), or ipsative (compared with one's previous scores). How the clinician's advice is delivered matters—a warm, empathetic, and non-judgmental style elicits greater cooperation and less resistance, particularly for patients not currently interested in change.^{59,119} A respectful, individualized approach first considers patient interest in change before warning about health risks or trying to convince the patient to take action.¹²² Helpful clinician advice also emphasizes the clinician's confidence in the patient's ability to change the behavior (building self-efficacy), and reassures the patient that there are multiple ways to approach successful change and sources to support the behavior change once it is undertaken.¹¹⁹ Acknowledging a patient's previous success in making changes can also boost the patient's confidence. Even considering all these elements, advice messages can be compactly constructed and short (30 to 60 seconds), particularly when coupled with additional assistance. Some clinicians are reluctant to advise patients because people seeking clinical care are not consciously seeking medical advice about their behavior. However, well-delivered advice is actually associated with improved satisfaction among smokers⁵⁴ and other patients with behavioral risk factors.³⁰ Experts recommend providing anticipatory advice for preventing risky sexual activity or tobacco, alcohol, and illicit drug use to all members of special populations, such as adolescents, even before risky behaviors are evident.¹²³

Agree

Here the patient and clinician "come to common ground"⁵¹ on area(s) where behavior change is to be considered or undertaken. When both agree that change is warranted, they then collaborate to define behavior-change goals or methods. The importance of collaborative care and patient agreement in a course of action was not explicit in the original 4 A's model, but medical thinking has shifted over recent decades to greater patient participation in many aspects of medical care.¹²⁴ Increasingly, treatment decisions are based on clinician-patient agreement after considering treatment options, consequences, and patient preferences.¹²⁵ Shared decision-making is specifically recommended by the USPSTF for preventive services that involve conflicting or highly individualized risk-benefit trade-offs.¹²⁶ Similarly, a collaborative approach that emphasizes patient choice and autonomy is critical in behavioral counseling intervention, where the patient retains ultimate control.

Patient involvement in decision-making about behavior change offers important benefits, even when decisions involving competing risks and benefits are not the overriding concern. Patients who are actively involved in health care decisions have a greater sense of personal control,¹²⁷ an important factor for successful behavior change. Also, patient involvement in decisions promotes choices based on realistic expectations and patient values,¹²⁸ which are important determinants of patient adherence or compliance.¹²⁹ Patient-centered approaches in which the patient and clinician mutually agree on specific changes may require less visit time than provider-centered ones¹³⁰ (see sidebar, "Agreement Strategies").

Agreement Strategies

Additional questions will help frame the rest of the intervention. For example, current tobacco intervention guidelines recommend assessing whether the patient is willing to make a quit attempt within the next 30 days.¹² If not, subsequent behavior-change assistance will consist of a motivational intervention to bolster confidence and readiness and address environmental and other barriers to change. If the

Continued on page M-64

Agreement Strategies (continued)

patient is ready to take action, then further behavioral counseling is provided, along with adjunctive medication or medical devices, if appropriate. For many behaviors, a few brief questions such as “How important is it for you to...” or “How confident are you that you can...” easily assess a person’s motivation and confidence to change a particular behavior, and quickly identify the most promising avenues for further assistance.¹²¹ This type of open-ended exchange can engage even the minimally interested patient in a nonthreatening way that may also increase knowledge, self-confidence, and motivation.

Actively engaging a patient’s agreement before proceeding with further behavioral counseling can also prevent resistance.¹²¹ Agreement considers the multiple treatment or intervention options available to help the patient achieve selected behavior change goals. For instance, patients can select home-based or fitness center options to increase their activity levels, nicotine fading or “cold turkey” approaches to smoking cessation, the use of varied contraceptive methods and/or abstinence to prevent pregnancy, and the choice of a wide variety of approaches to improving diet. Moreover, for each of these changes, patients can often choose between reliance on self-help and more intensive clinic methods, based on preference and perceived need for the more intensive skill training and higher levels of social support that clinic-based and face-to-face counseling provide. For people with multiple behavioral risks, agreement is needed about which behavior change(s) to tackle first.

Assist

In providing assistance, the primary care clinician or other health care staff offers additional treatment to address barriers to changes, increase the patient’s motivation and self-help skills, and/or help the patient secure the needed supports for successful behavior change. Effective primary care interventions seek to teach self-management and engage problem-solving/coping skills, thereby enabling the patient to undertake the next immediate step(s) in the targeted behavior change.⁷⁰

Those not ready to commit to making a specific behavior change in the near future often benefit from assistance strategies that explore ambivalence and enhance motivation.⁵⁹ As emphasized earlier, additional assistance through effective behavior-

change techniques need not be provided directly by the primary clinician solely within the context of a primary care visit. Clinicians may provide assistance through referral to other health care staff within the clinic or outside in the larger health care system or community. Importantly, such approaches typically involve multiple communication channels and intervention methods, which also improve intervention outcomes.^{12,19}

Additional assistance within or outside the patient visit is likely to produce better outcomes than minimal-contact, advice-only treatment. For example, even though 1-3 minutes of advice and counseling have been found to double smokers’ 6-month quit rates, time-intensive interventions and more numerous contacts produce even better effects.¹² Increasing the total contact time in an intervention (time per intervention X number of contacts) from the minimal 1 to 3 minutes to more than 30 minutes doubles the long-term quit rates yet again. Similarly, a recent analysis at the U.S. population level estimated the expected ex-smoker yields of increasing the proportion of physicians who provide systematic advice (1-3 minutes) to their smoking patients from 60% to 90%. That estimate was compared with also providing additional counseling assistance (10 minutes) by the clinician or other staff for the 50% of advised smokers interested in quitting.⁶⁶ The results showed that increasing rates of physician advice alone would yield an additional 63,000 quitters per year. Coupling the higher advice level with brief counseling assistance would increase annual quitters by a factor of 10 (630,000) (see sidebar, “Assistance Strategies”).

Assistance Strategies

Assistance techniques vary according to the behavior and the individual patient’s needs but include practical counseling (problem-solving skills training) to replace the problem behavior with new behaviors and to tackle environmental and physiological barriers to change. Assistance also can include direct support from the health care provider/team, guidance in obtaining social support from friends and family, the provision of self-help materials to support self-change

Continued on page M-65

Assistance Strategies (continued)

efforts, and the provision or prescription of appropriate medication or medical devices (eg, pharmacotherapy for tobacco dependence, contraceptives for prevention of unplanned pregnancy, and dietary supplements for certain weight loss regimens). Other effective behavior-change techniques include modeling and behavioral rehearsal, contingency contracting, stimulus control, stress-management training, and the use of self-monitoring and self-reward.¹³¹

Involving a variety of staff and using diverse, complementary intervention methods improve the feasibility and the effectiveness of providing further behavior change assistance. Interactive videos can deliver standardized portions of behavioral counseling interventions.²⁴ Telephone counseling and well-developed self-help materials provide additional channels for efficiently delivering effective interventions.^{23,27} If proven effective, computer-driven interventions will someday offer direct, interactive personalized contact through computer kiosks or the Internet that bypasses use of office staff and resources.²⁶ Within certain health care environments, such as managed care and health maintenance organizations, staff outside the clinical setting undertake written and telephone counseling that can result in feedback to the provider or medical chart.⁶⁸ For settings with few of these options, the delivery of appropriate behavior change assistance is more feasible if intervention activities are spread across clinical staff (eg, clinician, nurse, medical assistant, and receptionist).^{29,132,133}

Arrange

Arranging follow-up challenges us to reconceptualize behavioral risk factors as chronic problems that change over time.⁶⁷ No matter how intensive the initial assistance, some form of routine follow-up assessment and support through repeat visits, telephone calls, or other contact is generally deemed necessary in behavior change interventions. For one thing, follow-up contacts provide the opportunity to evaluate and adjust the behavior-change plan. Usually, this is accomplished by briefly repeating the first 4 A,s (assess, advise, agree, assist) to update the behavior-change plan, taking into

account the patient's intervening efforts, experience, and current perspective. Follow-up allows for support of behavior-change maintenance¹³⁴ and relapse prevention for those who have already made some significant behavior change.^{93,135} In general, follow-up is best scheduled within a relatively short time period (eg, 1 month), although the timing can be geared to provide support for a specific event (such as calling a few days after a set quit-smoking date). After initial intervention follow-up, future contacts are often spaced at successively longer intervals to provide needed support and continuity in a gradually reduced manner (see sidebar, "Arranging Implementation and Follow-up").

Arranging Implementation and Follow-up

Behavioral interventions can involve "stepped-care" approaches, similar to those used for hypertension management, with the need for referral to more intensive treatment or outside resources determined after evaluating response to briefer, less-intensive interventions during follow-up.⁴⁸ Simply notifying patients that follow-up will occur seems to be a powerful motivating factor,¹³⁶ communicating that the behavior change is important and that follow-up assistance will be available if needed. Clinical staff can systematically arrange follow-up assessment and support through repeat clinical visits, telephone calls, or other methods of contact between the patient and the health care system. Completion rates for follow-up and outside referral are important implementation process measures.

Recent advances in health communications can assist both clinicians and patients as they engage in appropriate adjustment of the behavior-change plan. For example, interactive computer programs coupled with the capacity for individually tailored output can track individual progress and adjust health promotion strategies to respond to the individual's preferences, rate of progress, and changing environments.¹³⁷ The diversity of populations that clinicians serve increases the importance of adjusting behavior change plans to the culture, social circumstances, and economic status of clients; such adjustment of health behavior change plans over time and across changing circumstances is an area where many health professionals need increased preparation and expertise.¹³⁸

Conclusions

Behavioral counseling interventions in clinical settings are an important means of addressing prevalent health-related behaviors, such as lack of physical activity, poor diet, substance (tobacco, alcohol, and illicit drug) use and dependence, and risky sexual behavior that underlie a substantial proportion of preventable morbidity and mortality in the United States. Important advances in the ways primary care interventions have been packaged have resulted from the past 2 decades of research. Most importantly, brief interventions designed to fit into everyday practice have been found to produce clinically meaningful changes in the population for a growing number of behavioral risk factors.

Future progress will depend on further refinement of the science supporting behavioral counseling interventions in clinical care through ongoing behavioral research and further development of standards and methods for the reporting and systematic review of behavioral counseling interventions. These advances will facilitate subsequent recommendation development for behavioral counseling topics. They will also facilitate the identification of common, as well as unique, key elements of behavioral counseling interventions across behaviors and populations and, thus, enhance their practical implementation by real clinicians and real patients in everyday clinical settings.

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References

1. U.S. Preventive Services Task Force. *Guide to Clinical Preventive Services*. 2nd ed. Washington DC: Office of Disease Prevention and Health Promotion, 1996.
2. Harris RP, Helfand M, Woolf SH, et al. Current methods of the U.S. Preventive Services Task Force. A review of the process. *Am J Prev Med*. 2001;20(suppl 3):21-35.
3. U.S. Department of Health and Human Services. *Healthy People 2010* (Conference Edition). Washington, DC: U.S. Government Printing Office; 2000.
4. Koop EC. Health promotion and disease prevention in clinical practice. In: Lawrence RS, Woolf SH, Jonas S, eds. *Health Promotion and Disease Prevention in Clinical Practice*. Baltimore, MD: Williams and Wilkins; 1996:vii-ix.
5. McGinnis JM, Foege WH. Actual causes of death in the United States. *JAMA*. 1993;270(18):2207-2212.
6. National Health Center for Health Statistics. *Healthy People 2000 Review*. Hyattsville, MD: Public Health Service; 1999.
7. Orleans CT, Ulmer C, Gruman J. The role of behavioral factors in achieving national health outcomes. In: Boll TJ, Bennet-Johnson S, eds. *Handbook of Health Psychology*. Washington, DC: American Psychological Association (in press).
8. Ewing GB, Selassie AW, Lopez CH, McCutcheon EP. Self-report of delivery of clinical preventive services by U.S. physicians. Comparing specialty, gender, age, setting of practice, and area of practice. *Am J Prev Med*. 1999;17(1):62-72.
9. Lemley KB, O'Grady ET, Rauckhorst L, Russell DD, Small N. Baseline data on the delivery of clinical preventive services provided by nurse practitioners. *Nurse Pract*. 1994;19(5):57-63.
10. Partnership for Prevention. *Why Invest in Disease Prevention?* Washington, DC: Partnership for Prevention; 1999.
11. Ashenden R, Silagy C, Weller D. A systematic review of the effectiveness of promoting lifestyle change in general practice. *Fam Pract*. 1997;14(2):160-176.
12. Fiore MC, Bailey WC, Cohen SJ, et al. *Treating Tobacco Use and Dependence. A Clinical Practice Guideline*. Rockville, MD: U.S. Dept. of Health and Human Services; 2000. AHRQ publication No. 00-0032.

13. Israel Y, Hollander O, Sanchez-Craig M, et al. Screening for problem drinking and counseling by the primary care physician-nurse team. *Alcohol Clin Exp Res.* 1996;20(8):1443-1450.
14. Kottke TE, Battista RN, DeFries GH, Brekke ML. Attributes of successful smoking cessation interventions in medical practice. A meta-analysis of 39 controlled trials. *JAMA.* 1988;259(19):2883-2889.
15. Fiore MC, Bailey WC, Cohen SJ, et al. Smoking Cessation. *Clinical Practice Guideline No. 18.* Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Healthcare Research and Quality; 1996. AHRQ Publication No. 96-0692.
16. WHO Brief Intervention Study Group. A cross-national trial of brief interventions with heavy drinkers. *Am J Public Health.* 1996;86(7):948-955.
17. Wilk AI, Jensen NM, Havighurst TC. Meta-analysis of randomized control trials addressing brief interventions in heavy alcohol drinkers. *J Gen Intern Med.* 1997;12(5):274-283.
18. Bien TH, Miller WR, Tonigan JS. Brief interventions for alcohol problems: a review. *Addiction.* 1993;88(3):315-335.
19. Mullen PD, Simons-Morton DG, Ramirez G, Frankowski RF, Green LW, Mains DA. A meta-analysis of trials evaluating patient education and counseling for three groups of preventive health behaviors. *Patient Educ Couns.* 1997;32(3):157-173.
20. Brunner E, White I, Thorogood M, Bristow A, Curle D, Marmot M. Can dietary interventions change diet and cardiovascular risk factors? A meta-analysis of randomized controlled trials. *Am J Public Health.* 1997;87(9):1415-1422.
21. Kahan M, Wilson L, Becker L. Effectiveness of physician-based interventions with problem drinkers: a review. *CMAJ.* 1995;152(6):851-859.
22. Fleming MF, Barry KL, Manwell LB, Johnson K, London R. Brief physician advice for problem alcohol drinkers. A randomized controlled trial in community-based primary care practices. *JAMA.* 1997;277(13):1039-1045.
23. Zhu SH. Telephone quitlines for smoking cessation. In: National Cancer Institute. *Population Based Smoking Cessation: Proceedings of a Conference on What Works to Influence Cessation in the General Population.* Smoking and Tobacco Control Monograph No. 12. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute; 2000. NIH Pub. No. 00-4892.
24. Stevens VJ, Glasgow RE, Toobert DJ, Karanja N, Smith KS. Randomized trial of a brief dietary intervention to decrease consumption of fat and increase consumption of fruit and vegetables. *Am J Health Promotion.* 2002;16(3):129-134.
25. Marcus BH, Nigg CR, Riebe D, Forsyth LH. Interactive communication strategies: implications for population-based physical-activity promotion. *Am J Prev Med.* 2000;19(2):121-126.
26. Fotheringham MJ, Owies D, Leslie E, Owen N. Interactive health communication in preventive medicine: internet-based strategies in teaching and research. *Am J Prev Med.* 2000;19(2):113-120.
27. Curry SJ. Self-help materials. In: National Cancer Institute. *Population Based Smoking Cessation: Proceedings of a Conference on What Works to Influence Cessation in the General Population.* Smoking and Tobacco Control Monograph No. 12. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute; 2000. NIH Pub. No. 00-4892.
28. Kreuter MW, Strecher VJ, Glassman B. One size does not fit all: the case for tailoring print materials. *Ann Behav Med.* 1999; 21(4):276-283.
29. Kottke TE, Edwards BS, Hagen PT. Counseling: implementing our knowledge in a hurried and complex world. *Am J Prev Med.* 1999;17(4):295-298.
30. Kottke TE, Solberg LI, Brekke ML, Cabrera A, Marquez M. Will patient satisfaction set the preventive services implementation agenda? *Am J Prev Med.* 1997;13(4):309-316.
31. Vogt TM, Hollis JF, Lichtenstein E, Stevens VJ, Glasgow R, Whitlock E. The medical care system and prevention: the need for a new paradigm. *HMO Pract.* 1998;12(1):5-13.
32. Wechsler H, Levine S, Idelson RK, Schor EL, Coakley E. The physician's role in health promotion revisited—a survey of primary care practitioners. *N Engl J Med.* 1996;334(15):996-998.
33. Valente CM, Sobal J, Muncie HL, Jr, Levine DM, Antlitz AM. Health promotion: physicians' beliefs, attitudes, and practices. *Am J Prev Med.* 1986;2(2):82-88.
34. Levine DM. The physician's role in health-promotion and disease prevention. *Bull NY Acad Med.* 1987;63(10):950-956.

35. Podl TR, Goodwin MA, Kikano GE, Stange KC. Direct observation of exercise counseling in community family practice. *Am J Prev Med.* 1999;17(3):207-210.
36. U.S. Bureau of the Census. *Statistical Abstract of the United States: 1998.* 118th ed. Washington, DC; 1998.
37. Zaza S, Lawrence RS, Mahan CS, et al. Scope and organization of the Guide to Community Preventive Services. The Task Force on Community Preventive Services. *Am J Prev Med.* 2000; 18(suppl 1):27-34.
38. Nupponen R. What is counseling all about—basics in the counseling of health-related physical activity. *Patient Educ Couns.* 1998;33(suppl 1):S61-S67.
39. Elder JP, Ayala GX, Harris S. Theories and intervention approaches to health-behavior change in primary care. *Am J Prev Med.* 1999;17(4):275-284.
40. Smedley BD, Syme SL, eds. Promoting health: Intervention strategies from social and behavioral research. Institute of Medicine. Washington DC: National Academy Press; 2000.
41. Glanz K, Lewis F, Rimer B. Linking theory, research, and practice. In: Glanz K, Lewis F, Rimer B, eds. *Health Behavior and Health Education: Theory, Research and Practice.* 2nd ed. San Francisco, CA: Jossey-Bass; 1999.
42. Abrams DB, Emmons KM, Linnan LA. Health behavior and health education: The past, present, and future. In: Glanz K, Lewis F, Rimer B, eds. *Health Behavior and Health Education: Theory, Research and Practice.* 2nd ed. San Francisco, CA: Jossey-Bass; 1999:453-478.
43. Heaney CA, Israil BA. Social networks and social support. In: Glanz K, Lewis F, Rimer B, eds. *Health Behavior and Health Education: Theory, Research and Practice.* 2nd ed. San Francisco, CA: Jossey-Bass; 1999:179-205.
44. Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. *J Consult Clin Psychol.* 1983;51(3):390-395.
45. National Cancer Institute. *Theory at a Glance: A Guide for Health Promotion Practice.* Bethesda, MD: National Institutes of Health, National Cancer Institute; 1995. NIH Publication No. 95-3896.
46. Stokols D, Allen J, Bellingham RL. The social ecology of health promotion: implications for research and practice. *Am J Health Promot.* 1996;10(4):247-251.
47. Institute of Medicine. *Health and Behavior: The Interplay of Biological, Behavioral, and Societal Influences.* Washington, DC: National Academy Press; 2001.
48. Abrams DB, Orleans CT, Niaura RS, Goldstein MG, Prochaska JO, Velicer WF. Integrating individual and public health perspectives for treatment of tobacco dependency in managed care: A combined stepped-care and matching model. *Ann Behav Med.* 1996;10(4):20-304.
49. Orleans CT. Treating nicotine dependence in medical settings. In: Orleans CT, Slade J, eds. *Nicotine Addiction: Principles and Management.* New York: Oxford University Press; 1993:148-150.
50. Safran DG, Taira DA, Rogers WH, Kosinski M, Ware JE, Tarlov AR. Linking primary care performance to outcomes of care. *J Fam Pract.* 1998;47(3):213-220.
51. Stewart MA. Effective physician-patient communication and health outcomes: A review. *CMAJ.* 1995;152(9):1423-1433.
52. Galuska DA, Will JC, Serdula MK, Ford ES. Are health care professionals advising obese patients to lose weight? *JAMA.* 1999;282(16):1576-1578.
53. Hunt JR, Kristal AR, White E, Lynch JC, Fries E. Physician recommendations for dietary change: their prevalence and impact in a population-based sample. *Am J Public Health.* 1995;85(5):722-726.
54. Hollis JF, Bills R, Whitlock E, Stevens VJ, Mullooly J, Lichtenstein E. Implementing tobacco interventions in the real world of managed care. *Tob Control.* 2000;9(suppl 1):I18-I24.
55. Schauffler HH, Rodriguez T, Milstein A. Health education and patient satisfaction. *J Fam Pract.* 1996;42(1):62-68.
56. Kreuter MW, Chheda SG, Bull FC. How does physician advice influence patient behavior? Evidence for a priming effect. *Arch Fam Med.* 2000;9(5):426-433.
57. O'Connor PJ, Rush WA, Prochaska JO, Pronk NP, Boyle RG. Professional advice and readiness to change behavioral risk factors among members of a managed care organization. *Am J Manag Care.* 2001;7(2):125-130.
58. Jones T, Fowler MC, Hubbard D. Refining a tool to measure cues to action in encouraging health-promoting behavior—the CHAQ. *Am J Health Promot.* 2000;14(3):170-173, iii.

59. Emmons KM, Rollnick S. Motivational interviewing in health care settings. Opportunities and limitations. *Am J Prev Med.* 2001;20(1):68-74.
60. Simpson M, Buckman R, Stewart M, et al. Doctor-patient communication: The Toronto consensus statement. *BMJ.* 1991;303(6814):1385-1387.
61. Kristal AR, Curry SJ, Shattuck AL, Feng Z, Li S. A randomized trial of a tailored, self-help dietary intervention: the Puget Sound Eating Patterns study. *Prev Med.* 2000;31(4):380-389.
62. Parish DC. Another indication for screening and early intervention: problem drinking. *JAMA.* 1997;277(13):1079-1080.
63. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health.* 1999;89(9):1322-1327.
64. Prochaska JO. A stage paradigm for integrating clinical and public health approaches to smoking cessation. *Addict Behav.* 1996;21(6):721-732.
65. Rose G. Sick individuals and sick populations. *Int J Epidemiol.* 1985;14(1):32-38.
66. Hollis JF. Population impact of clinician efforts to reduce tobacco. In: National Cancer Institute. *Population Based Smoking Cessation: Proceedings of a Conference on What Works to Influence Cessation in the General Population.* Smoking and Tobacco Control Monograph No. 12. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute; 2000:129-154. NIH Pub. No. 00-4892.
67. Glasgow R, Orleans CT, Wagner EH, Curry SJ, Solberg LI. Does the chronic care model serve also as a template for improving prevention? *Milbank Quarterly.* 2001;79(4):579-612.
68. Thompson RS, Taplin SH, McAfee TA, Mandelson MT, Smith AE. Primary and secondary prevention services in clinical practice: Twenty years' experience in development, implementation, and evaluation. *JAMA.* 1995;273(14):1130-1135.
69. Thompson RS. What have HMOs learned about clinical prevention services? An examination of the experience at Group Health Cooperative of Puget Sound. *Milbank Q.* 1996;74(4):469-509.
70. Goldstein MG, DePue J, Kazuira A. Models for provider-patient interaction: Applications to health behavior change. In Shumaker SA, Schon EB, Ockene JK, McBeem W.L., eds. 2nd ed. *The Handbook of Health Behavior Change.* New York: Springer Pub. Co.; 1998:85-113.
71. Orleans CT, George LK, Houtp JL, Brodie KH. Health promotion in primary care: A survey of U.S. family practitioners. *Prev Med.* 1985;14(5):636-647.
72. American College of Preventive Medicine. *1998 National Prevention in Primary Care Study.* Washington, DC: American College of Preventive Medicine; 1998.
73. Timmerman GM, Reifsnider E, Allan JD. Weight management practices among primary care providers. *J Am Acad Nurse Pract.* 2000;12(4):113-116.
74. Davis D, O'Brien MA, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. Impact of formal continuing medical education: Do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *JAMA.* 1999;282(9):867-874.
75. Ockene JK, Ockene IS, Quirk ME, et al. Physician training for patient-centered nutrition counseling in a lipid intervention trial. *Prev Med.* 1995;24(6):563-570.
76. Marcus BH, Goldstein MG, Jette A, et al. Training physicians to conduct physical activity counseling. *Prev Med.* 1997;26(3):382-388.
77. Leininger LS, Finn L, Dickey L, et al. An office system for organizing preventive services: A report by the American Cancer Society Advisory Group on Preventive Health Care Reminder Systems. *Arch Fam Med.* 1996;5(2):108-115.
78. Ockene IS, Hebert JR, Ockene JK, et al. Effect of physician-delivered nutrition counseling training and an office-support program on saturated fat intake, weight, and serum lipid measurements in a hyperlipidemic population: Worcester Area Trial for Counseling in Hyperlipidemia (WATCH). *Arch Intern Med.* 1999;159(7):725-731.
79. Solberg LI, Kottke TE, Brekke ML, Conn SA, Magnan S, Amundson G. The case of the missing clinical preventive services systems. *Eff Clin Pract.* 1998;1(1):33-38.
80. Solberg LI, Kottke TE, Brekke ML. Will primary care clinics organize themselves to improve the delivery of preventive services? A randomized controlled trial. *Prev Med.* 1998;27(4):623-631.
81. Goodwin MA, Zyzanski SJ, Zronek S, et al. A clinical trial of tailored office systems for preventive service delivery: The Study to Enhance Prevention by Understanding Practice (STEP-UP). *Am J Prev Med.* 2001; 21(1):20-28.

82. Agency for Healthcare Research and Quality. Put Prevention into Practice (PPIP). Available at: www.ahrq.gov/clinic/ppipix.htm. Accessed on December 19, 2001.
83. Hollis JF, Lichtenstein E, Vogt TM, Stevens VJ, Biglan A. Nurse-assisted counseling for smokers in primary care. *Ann Intern Med.* 1993;118(7):521-525.
84. Burns DM. Smoking cessation: Recent indicators of what's working at a population level. In: National Cancer Institute. *Population Based Smoking Cessation: Proceedings of a Conference on What Works to Influence Cessation in the General Population*. Smoking and Tobacco Control Monograph No. 12. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute;2000:1-24. NIH Pub. No. 00-4892.
85. Orleans CT, Schoenbach VJ, Wagner EH, et al. Self-help quit smoking interventions: effects of self-help materials, social support instructions, and telephone counseling. *J Consult Clin Psychol.* 1991;59(3):439-448.
86. Jeffery RW. Risk behaviors and health: Contrasting individual and population perspectives. *Am Psychol.* 1989;44(9):1194-1202.
87. Noell J, Glasgow RE. Interactive technology applications for behavioral counseling: Issues and opportunities for health care settings. *Am J Prev Med.* 1999; 17(4):269-274.
88. Campbell MK, DeVellis BM, Strecher VJ, Ammerman AS, DeVellis RF, Sandler RS. Improving dietary behavior: the effectiveness of tailored messages in primary care settings. *Am J Public Health.* 1994;84(5):783-787.
89. Skinner CS, Campbell MK, Rimer BK, Curry S, Prochaska JO. How effective is tailored print communication? *Ann Behav Med.* 1999;21(4):290-298.
90. Strecher VJ, Kreuter M, Den Boer DJ, Kobrin S, Hospers HJ, Skinner CS. The effects of computer-tailored smoking cessation messages in family practice settings. *J Fam Pract.* 1994;39(3):262-270.
91. Hughes JR. The future of smoking cessation therapy in the United States. *Addiction.* 1996;91(12):1797-1802.
92. Normand J, Vlahov D, Moses LE, eds. Preventing HIV Transmission: The Role of Sterile Needles and Bleach. Washington, DC: National Academy Press; 1995.
93. Weingart KR, Manlatt AG. Sustaining change: Helping those who are still using. In: Miller WR, Heather N, eds. *Treating Addictive Behaviors*. 2nd ed. New York: Plenum Press; 1998:337-351.
94. Atkins D, DiGiuseppi CG. Broadening the evidence base for evidence-based guidelines: A research agenda based on the work of the U.S. Preventive Services Task Force. *Am J Prev Med.* 1998;14(4):335-344.
95. Pinto BM, Lynn H, Marcus BH, DePue J, Goldstein MG. Physician-based activity counseling: Intervention effects on mediators of motivational readiness for physical activity. *Ann Behav Med.* 2001;23(1):2-10.
96. Eden KB, Orleans CT, Mulrow CD, Pender NJ, Teutsch SM. *Counseling to Promote Physical Activity*. Systematic Evidence Review. Rockville, MD: Agency for Healthcare Research and Quality; 2001 (in process).
97. Altman DG, Schulz KF, Moher D, Egger M, Davidoff F, Elbourne D et al. The revised CONSORT statement for reporting randomized trials: Explanation and elaboration. *Ann Intern Med* 2001;134(8):663-694.
98. House JS, Williams DR. Understanding and reducing socioeconomic and racial/ethnic disparities in health. In: Institute of Medicine. *Promoting Health: Intervention Strategies From Social and Behavioral Research*. Smedley BD, Syme SL, eds. Washington, DC: National Academy Press; 2000:81-124.
99. Fuligni AD, Brooks-Gunn J. The health development of young children: SES disparities in health. In: Institute of Medicine. *Promoting Health: Intervention Strategies From Social and Behavioral Research*. Smedley BD, Syme SL, eds. Washington, DC: National Academy Press; 2000:170-216.
100. Perry CL. Preadolescent and adolescent influences on health. In: Institute of Medicine. *Promoting Health: Intervention Strategies From Social and Behavioral Research*. Smedley BD, Syme SL, eds. Washington, DC: National Academy Press; 2000:217-253.
101. Emmons KM. Behavioral and social science contributions to the health of adults in the United States. In: Institute of Medicine. *Promoting Health: Intervention Strategies From Social and Behavioral Research*. Smedley BD, Syme SL, eds. Washington, DC: National Academy Press; 2000:254-321.
102. Agency for Healthcare Research and Quality. U.S. Preventive Services Task Force (USPSTF). Available at: <http://www.ahrq.gov/clinic/uspstfix.htm>. Accessed on: 12-19-01.

103. Glynn TJ, Manley MW. *How to Help Your Patients Stop Smoking. A Manual for Physicians*. Bethesda, MD: National Cancer Institute; 1989. NIH Pub: 89-3064.
104. Rakowski W. The potential variances of tailoring in health behavior interventions. *Ann Behav Med*. 1999;21(4):284-289.
105. Sikorski J, Renfrew MJ. Support for breastfeeding mothers (Cochrane Review). In: *The Cochrane Library*. Oxford: Update Software; 2001.
106. Calfas KJ, Long BJ, Sallis JF, Wooten WJ, Pratt M, Patrick K. A controlled trial of physician counseling to promote the adoption of physical activity. *Prev Med*. 1996;25(3):225-233.
107. Rimer BK, Orleans CT, Fleisher L, et al. Does tailoring matter? The impact of a tailored guide on ratings and short-term smoking-related outcomes for older smokers. *Health Educ Res*. 1994;9(1):69-84.
108. Royce JM, Corbett K, Sorensen G, Ockene J. Gender, social pressure, and smoking cessations: The Community Intervention Trial for Smoking Cessation (COMMIT) at baseline. *Soc Sci Med*. 1997;44(3):359-370.
109. King TK, Borrelli B, Black C, Pinto BM, Marcus BH. Minority women and tobacco: implications for smoking cessation interventions. *Ann Behav Med*. 1997;19(3):301-313.
110. Gazmararian J, Baker D, Williams M, et al. Health literacy among Medicare enrollees in a managed care organization. *JAMA*. 1999;281(6):545-551.
111. Strecher VJ, Kreuter MW. Health risk appraisal from a behavioral perspective: present and future. In: Hyer GC, Peterson KW, Travis JW, Dewey JE, Foerster JJ, Frammer EM, eds. *Society of Prospective Medicine Handbook of Health Assessment Tools*. Pittsburgh, PA: the Society; 1999:75-82.
112. National Institutes of Health. Behavior Change Consortium. Available at: www1.od.nih.gov/behaviorchange/index.htm. Accessed on December 19, 2001.
113. Newell SA, Girgis A, Sanson-Fisher RW, Savolainen NJ. The accuracy of self-reported health behaviors and risk factors relating to cancer and cardiovascular disease in the general population: A critical review. *Am J Prev Med*. 1999;17(3):211-229.
114. Ofstead C, Gobran D. Practical guidelines for maximizing the impact of assessment. In: Hyer GC, Peterson KW, Travis JW, Dewey JE, Foerster JJ, Frammer EM, es. *Society of Prospective Medicine Handbook of Health Assessment Tools*. Pittsburgh, PA: the Society; 1999:155-160.
115. Whitlock EP, Hollis JF. From research to practice: Helping medical systems integrate nurse-assisted tobacco intervention into routine clinical practice. Seattle, WA: Presented to International Conference of the American Thoracic Society; 1995.
116. Bond D, Hyner GC. Lifestyle-specific outcome measures. In: Hyer GC, Peterson KW, Travis JW, Dewey JE, Foerster JJ, Frammer EM, eds. *Society of Prospective Medicine Handbook of Health Assessment Tools*. Pittsburgh, PA: the Society; 1999:25-32.
117. Beresford SA, Curry SJ, Kristal AR, Lazovich D, Feng Z, Wagner EH. A dietary intervention in primary care practice: The Eating Patterns Study. *Am J Public Health*. 1997;87(4):610-616.
118. Ainsworth BE, Bassett DR, Jr, Strath SJ, et al. Comparison of three methods for measuring the time spent in physical activity. *Med Sci Sports Exerc*. 2000;32(9 suppl):S457-S464.
119. Miller WR, Rollnick S. *Motivational Interviewing: Preparing People to Change Addictive Behavior*. New York: Guilford Press; 1991.
120. Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs. Health literacy: Report of the Council on Scientific Affairs. *JAMA*. 1999;281(6):552-557.
121. Rollnick S, Mason P, Butler C. *Health Behavior Change: A Guide for Practitioners*. Edinburgh/New York: Churchill Livingstone; 1999.
122. Solberg LI, Kottke TE. Patient perceptions: An important contributor to how physicians approach tobacco cessation. *Tob Control*. 1998;7(4):421-422.
123. American Medical Association. *Guidelines for Adolescent Preventive Services (GAPS): Recommendations Monograph*. Chicago: American Medical Association; 1997.
124. Little P, Everitt H, Williamson I, et al. Preferences of patients for patient centered approach to consultation in primary care: Observational study. *BMJ*. 2001;322(7284):468-472.
125. Frosch DL, Kaplan RM. Shared decision making in clinical medicine: Past research and future directions. *Am J Prev Med*. 1999;17(4):285-294.
126. Woolf SH, Atkins D. The evolving role of prevention in health care: Contributions of the U.S.

- Preventive Services Task Force. *Am J Prev Med*. 2001;20(suppl 3):13-20.
127. Lerman CE, Brody DS, Caputo GC, Smith DG, Lazaro CG, Wolfson HG. Patients' Perceived Involvement in Care Scale: Relationship to attitudes about illness and medical care. *J Gen Intern Med*. 1990;5(1):29-33.
128. Miller WR. Enhancing motivation for change. In: Miller WR, Heather N, eds. *Treating Addictive Behaviors*. 2nd ed. New York: Plenum Press; 1998:121-132.
129. Donovan JL, Blake DR. Patient non-compliance: Deviance or reasoned decision-making? *Soc Sci Med*. 1992;34(5):507-513.
130. Adams A, Ockene JK, Wheller EV, Hurley TG. Alcohol counseling: Physicians will do it. *J Gen Intern Med*. 1998;13(10):692-698.
131. Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice Hall; 1986.
132. Dickey LL, Gemson DH, Carney P. Office system interventions supporting primary care-based health behavior change counseling. *Am J Prev Med*. 1999;17(4):299-308.
133. Glasgow RE, Whitlock EP, Eakin EG, Lichtenstein E. A brief smoking cessation intervention for women in low-income planned parenthood clinics. *Am J Public Health*. 2000;90(5):786-789.
134. Orleans CT. Promoting the maintenance of health behavior change: Recommendations for the next generation of research and practice. *Health Psychol*. 2000;19(suppl 1):76-83.
135. Donovan DL. Continuing care: Promoting the maintenance of change. In: Miller WR, Heather N, eds. *Treating Addictive Behaviors*. New York: Plenum Press; 1998:317-336.
136. Lichtenstein E, Glasgow RE. Smoking cessation: What have we learned over the past decade? *J Consult Clin Psychol*. 1992;60(4):518-527.
137. Krueger J, Farrell D, Olevitch L, Brennan L. *Tailoring Health Messages: Customizing Communication With Computer Technology*. Mahwah, NJ: Erlbaum; 2000.
138. Pender N. *Health Promotion in Nursing Practice*. Stamford, CT: Appleton and Lange; 1996.