

This chapter addresses the treatment and assessment characteristics outlined in Tables 6.1 and 6.2 and is divided into three sections: (1) evidence for counseling and psychosocial interventions; (2) evidence for medication interventions; and (3) evidence for systems changes. For each topic, background information, clinical recommendations, and the basis for those recommendations are provided. As described in Chapter 1, each recommendation was given a strength-of-evidence classification based on the criteria shown in Table 6.3. Finally, for many topics, recommendations for further research are provided.

Table 6.3. Summary of strength of evidence for recommendations

Strength-of-evidence classification	Criteria
Strength of Evidence = A	Multiple well-designed randomized clinical trials, directly relevant to the recommendation, yielded a consistent pattern of findings.
Strength of Evidence = B	Some evidence from randomized clinical trials supported the recommendation, but the scientific support was not optimal. For instance, few randomized trials existed, the trials that did exist were somewhat inconsistent, or the trials were not directly relevant to the recommendation.
Strength of Evidence = C	Reserved for important clinical situations in which the Panel achieved consensus on the recommendation in the absence of relevant randomized controlled trials.

A. Counseling and Psychosocial Evidence

1. Screening and Assessment

■ Screen for Tobacco Use

Recommendation: All patients should be asked if they use tobacco and should have their tobacco use status documented on a regular basis. Evidence has shown that clinic screening systems, such as expanding the vital signs to include tobacco use status or the use of other reminder systems such as chart stickers or computer prompts, significantly increase rates of clinician intervention. (Strength of Evidence = A)

The Panel relied on the meta-analyses from the original 1996 Guideline to determine the impact of tobacco screening systems. Tobacco screening

systems were evaluated in terms of their impact on two outcomes: the rate of tobacco treatment by clinicians, and the rate of cessation by patients who smoke.

Identifying Tobacco Users: Impact on Clinical Intervention. Nine studies met the selection criteria and were meta-analyzed as part of the 1996 Guideline to assess the impact of screening systems on the rate of smoking cessation intervention by clinicians. The results of this meta-analysis are shown in Table 6.4. Implementing clinic systems designed to increase the assessment and documentation of tobacco use status markedly increases the rate at which clinicians intervene with their patients who smoke.

Table 6.4. Meta-analysis (1996): Impact of having a tobacco use status identification system in place on rates of clinician intervention with their patients who smoke (n = 9 studies)^a

Screening system	Number of arms	Estimated odds ratio (95% C.I.)	Estimated rate of clinician intervention (95% C.I.)
No screening system in place to identify smoking status (reference group)	9	1.0	38.5
Screening system in place to identify smoking status	9	3.1 (2.2–4.2)	65.6 (58.3–72.6)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Identifying Tobacco Users: Impact on Tobacco Cessation. Three studies met the selection criteria and were meta-analyzed as part of the 1996 Guideline to assess the impact of identifying smokers on actual rates of smoking cessation. The results of this meta-analysis are shown in Table 6.5. These results, combined with the results from Table 6.4, show that having a clinic system in place that identifies smokers increases rates of clinician intervention but does not, by itself, produce significantly higher rates of smoking cessation.

Strategy A1 (see Chapter 3A) and Systems Strategy 1 (see Chapter 5) detail an approach for including tobacco use status as a vital sign with systematic prompts and reminders. Although the data assessing this intervention were gathered exclusively from cigarette smokers, the Panel believed

that these results are generalizable to all tobacco users. This approach is designed to produce consistent assessment and documentation of tobacco use. Evidence from controlled trials shows that this approach increases the probability that tobacco use is assessed and documented consistently.^{54,232} However, documenting smoking status is not by itself sufficient to promote treatment by clinicians.²³³ Systems changes beyond smoker identification strategies are likely to be needed to increase rates of cessation advice and intervention.^{139,234-237}

Table 6.5. Meta-analysis (1996): Impact of having a tobacco use status identification system in place on abstinence rates among patients who smoke (n = 3 studies)^a

Screening system	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No screening system in place to identify smoking status (reference group)	3	1.0	3.1
Screening system in place to identify smoking status	3	2.0 (0.8–4.8)	6.4 (1.3–11.6)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

■ Specialized Assessment

Recommendation: Once a tobacco user is identified and advised to quit, the clinician should assess the patient's willingness to quit at this time. (Strength of Evidence = C)

If the patient is willing to make a quit attempt at this time, interventions identified as effective in this Guideline should be provided. (See Chapters 3A and 4.)

If the patient is unwilling to quit at this time, an intervention designed to increase future quit attempts should be provided. (See Chapter 3B.)

Recommendation: Tobacco dependence treatment is effective and should be delivered even if specialized assessments are not used or available. (Strength of Evidence = A)

Every individual entering a health care setting should receive an assessment that determines his or her tobacco use status and interest in quitting. The patient should be asked, “Are you willing to make a quit attempt at this time?” Such an assessment (willing or unwilling) is a necessary first step in treatment. In addition, every patient should be assessed for physical or medical conditions that may affect the use of planned treatments (e.g., medication).

The clinician also may want to perform specialized assessments of individual and environmental attributes that provide information for tailoring treatment and that predict quitting success. Specialized assessments refer to the use of formal instruments (e.g., questionnaires, clinical interviews, or physiologic indices such as carbon monoxide, serum nicotine/cotinine levels, and/or pulmonary function) that may be associated with cessation outcome (in addition, the reader may find other assessments relevant to medication use and specific populations when selecting treatment). Some of the variables targeted by specialized assessments that predict quitting success are listed in Table 6.6.

Several considerations should be kept in mind regarding the use of specialized assessments. First, there is little consistent evidence that a smoker’s status on a specialized assessment is useful for treatment matching. The one exception is that persons who are highly nicotine dependent may benefit more from higher nicotine gum or lozenge doses (see Medication Evidence; Section B of Chapter 6). More importantly, the Panel found that, regardless of their standing on specialized assessments, all smokers have the potential to benefit from tobacco dependence treatments. Therefore, delivery of tobacco dependence treatments should not depend on the use of specialized assessments. Finally, tailored interventions based on specialized assessments do not consistently produce higher long-term quit rates than do nontailored interventions of equal intensity. Some promising studies exist, however, that suggest that individualizing self-help materials may be beneficial (see Individually Tailored and Stepped-Care Interventions, page 92).²³⁸⁻²⁴⁵ In addition, the Panel recognizes that some effective interventions, such as general problemsolving (see Types of Counseling and Behavioral Therapies, on page 96), entail treatment tailoring based on a systematic assessment that occurs as an integral part of treatment.

Table 6.6. Variables associated with higher or lower abstinence rates

Variables associated with higher abstinence rates	
Variable	Examples
High motivation	Tobacco user reports a strong motivation to quit.
Ready to change	Tobacco user is ready to quit within a 1-month period.
Moderate to high self-efficacy	Tobacco user is confident in his or her ability to quit.
Supportive social network	A smoke-free workplace and home; friends who do not smoke in the quitter's presence.
Variables associated with lower abstinence rates	
Variable	Examples
High nicotine dependence	Tobacco user smokes heavily (≥ 20 cigarettes/day), and/or has first cigarette of the day within 30 minutes after waking in the morning.
Psychiatric comorbidity and substance use	Tobacco user currently has elevated depressive symptoms, active alcohol abuse, or schizophrenia.
High stress level	Stressful life circumstances and/or recent or anticipated major life changes (e.g., divorce, job change).
Exposure to other smokers	Other smokers in the household.

The existing evidence suggests that treatment can be effective despite the presence of risk factors for relapse (e.g., high nicotine dependence, other smokers in the home), but abstinence rates in smokers with these characteristics tend to be lower than rates in those without these characteristics.²⁴⁶⁻²⁴⁸

■ Future Research

The following topics regarding specialized assessment require additional research:

- Whether treatment adjustment based on specialized assessments can improve long-term abstinence rates

- Whether working to change the social network can improve abstinence rates (e.g., intervening with other smokers in the household to change their smoking patterns, teaching quitting support, or encouraging a smokefree home)
- Disparities in screening and assessment in specific populations

2. Treatment Structure and Intensity

■ Advice To Quit Smoking

Recommendation: All *physicians* should strongly advise every patient who smokes to quit because evidence shows that physician advice to quit smoking increases abstinence rates. (Strength of Evidence = A)

For these recommendations, the 2008 Guideline Panel relied on meta-analyses performed for the 1996 Guideline. Seven studies were included in the 1996 meta-analysis of the effectiveness of physician advice to quit smoking. In the studies used in this analysis, the modal length of clinician intervention was 3 minutes or less. Two studies in this analysis used interventions lasting about 5 minutes. Results of the meta-analysis on physician advice are shown in Table 6.7. This analysis shows that brief physician advice significantly increases long-term smoking abstinence rates. These results were also supported by a more recent, independent meta-analysis.⁵⁶

Advice by physicians was examined in the Table 6.7 meta-analysis from the 1996 Guideline; there were too few studies to examine advice delivered by any other type of clinician, although one study found that advice to quit from health care providers in general did significantly increase quit rates.²⁴⁹ The analysis for total amount of contact time (see Table 6.9) indicates that minimal counseling (advice) delivered by a variety of clinician types increases long-term abstinence rates. Also, studies have shown that dentists and dental hygienists can be effective in assessing and advising smokeless/spit tobacco users to quit²⁵⁰ (see Chapter 7). Given the large number of smokers who visit a clinician each year, the potential public health impact of universal advice to quit is substantial.⁵⁶

Table 6.7. Meta-analysis (1996): Effectiveness of and estimated abstinence rates for advice to quit by a physician (n = 7 studies)^a

Advice	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No advice to quit (reference group)	9	1.0	7.9
Physician advice to quit	10	1.3 (1.1–1.6)	10.2 (8.5–12.0)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

■ Future Research

The following topics regarding advice to quit require additional research:

- Effectiveness of advice to quit smoking given by clinicians other than physicians (e.g., nurses, nurse practitioners, pharmacists, dentists, dental hygienists, tobacco treatment specialists, physician's assistants)
- Cumulative effectiveness of combined advice from physicians and other types of clinicians

■ Intensity of Clinical Interventions

Recommendation: Minimal interventions lasting less than 3 minutes increase overall tobacco abstinence rates. Every tobacco user should be offered at least a minimal intervention, whether or not he or she is referred to an intensive intervention. (Strength of Evidence = A)

Recommendation: There is a strong dose-response relation between the session length of person-to-person contact and successful treatment outcomes. Intensive interventions are more effective than less intensive interventions and should be used whenever possible. (Strength of Evidence = A)

Recommendation: Person-to-person treatment delivered for four or more sessions appears especially effective in increasing abstinence rates. Therefore, if feasible, clinicians should strive to meet four or more times with individuals quitting tobacco use. (Strength of Evidence = A)

These recommendations are supported by three separate meta-analyses conducted for the 2000 Guideline: one involving session length, one involving total amount of contact time, and one involving the number of sessions.

Table 6.8. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for various intensity levels of session length (n = 43 studies)^a

Level of contact	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No contact	30	1.0	10.9
Minimal counseling (< 3 minutes)	19	1.3 (1.01–1.6)	13.4 (10.9–16.1)
Low-intensity counseling (3–10 minutes)	16	1.6 (1.2–2.0)	16.0 (12.8–19.2)
Higher intensity counseling (> 10 minutes)	55	2.3 (2.0–2.7)	22.1 (19.4–24.7)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Session Length. Forty-three studies met selection criteria for comparison across various session lengths. Whenever possible, session length was categorized based on the maximum amount of time the clinician spent with a smoker addressing tobacco dependence in a single contact. Minimal counseling interventions were defined as 3 minutes or less, low-intensity counseling was defined as greater than 3 minutes to 10 minutes, and higher intensity counseling interventions were defined as greater than 10 minutes. Interventions could involve multiple patient-clinician contacts, with the session length determined for coding purposes as the length of time of the longest session. These levels of person-to-person contact were compared with a no-contact reference group involving study conditions in which subjects received no person-to-person contact (e.g., self-help-only conditions). There is a dose-response relation between session length and abstinence rates. As Table 6.8 shows, all three session lengths (minimal counseling, low-intensity counseling, and higher intensity counseling) significantly increased abstinence rates over those produced by no-contact conditions. However, there was a clear trend for abstinence rates to increase across these session lengths, with higher intensity counseling producing the highest rates.

Total Amount of Contact Time. Thirty-five studies met the selection criteria for the analysis assessing the impact of total contact time. The amount of contact time was calculated from the text as the total time accumulated (the number of sessions multiplied by the session length). When the exact time was not known for minimal and low-intensity interventions, they were assigned median lengths of 2 and 6.5 minutes, respectively. The total amount of contact time was then categorized as no-contact, 1–3 minutes, 4–30 minutes, 31–90 minutes, 91–300 minutes, and greater than 300 minutes. As Table 6.9 shows, any contact time significantly increased abstinence rates over those produced by no contact. However, there was a clear trend for abstinence rates to increase across contact time, up to the 90-minute mark. There was no evidence that more than 90 minutes of total contact time substantially increases abstinence rates.

Table 6.9. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for total amount of contact time (n = 35 studies)^a

Total amount of contact time	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No minutes	16	1.0	11.0
1–3 minutes	12	1.4 (1.1–1.8)	14.4 (11.3–17.5)
4–30 minutes	20	1.9 (1.5–2.3)	18.8 (15.6–22.0)
31–90 minutes	16	3.0 (2.3–3.8)	26.5 (21.5–31.4)
91–300 minutes	16	3.2 (2.3–4.6)	28.4 (21.3–35.5)
> 300 minutes	15	2.8 (2.0–3.9)	25.5 (19.2–31.7)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Number of Sessions. Forty-six studies involving at least some person-to-person contact met selection criteria for the analysis addressing the impact of number of treatment sessions. Zero or one session was used as the reference group. As shown in Table 6.10, multiple treatment sessions increase smoking abstinence rates over those produced by zero or one session. The evidence suggests a dose-response relation between number of sessions and treatment effectiveness.

It is important to note that although the use of more intensive interventions (i.e., longer sessions, more sessions) may produce enhanced abstinence rates, these interventions may have limited reach (affect fewer smokers) and may not be feasible in some primary care settings. For instance,

not all smokers are interested in participating in an intensive intervention, and not all smokers may have access to or be able to afford services that can provide intensive interventions. Finally, the clinician can link the patient to additional treatment options, such as quitlines or other intensive cessation treatment programs, to provide additional person-to-person treatment.

■ Future Research

The following topics regarding intensity of person-to-person contact require additional research:

- Effects of treatment duration, timing, and spacing of sessions (i.e., the number of days or weeks over which treatment is spread). For instance, does front loading sessions (having the majority of the sessions during the first few weeks of a quit attempt) or spacing sessions throughout the quit attempt yield better long-term abstinence rates?
- Methods to increase the appeal and utilization of intensive treatments
- Effectiveness of intensive inpatient treatment programs

Table 6.10. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for number of person-to-person treatment sessions (n = 46 studies)^a

Number of sessions	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
0–1 session	43	1.0	12.4
2–3 sessions	17	1.4 (1.1–1.7)	16.3 (13.7–19.0)
4–8 sessions	23	1.9 (1.6–2.2)	20.9 (18.1–23.6)
> 8 sessions	51	2.3 (2.1–3.0)	24.7 (21.0–28.4)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

■ Type of Clinician

Recommendation: Treatment delivered by a variety of clinician types increases abstinence rates. Therefore, all clinicians should provide smoking cessation interventions. (Strength of Evidence = A)

Recommendation: Treatments delivered by multiple types of clinicians are more effective than interventions delivered by a single type of clinician. Therefore, the delivery of interventions by more than one type of clinician is encouraged. (Strength of Evidence = C)

Clinician Types. Twenty-nine studies met selection criteria for the 2000 meta-analysis examining the effectiveness of various types of clinicians providing tobacco use treatment. These analyses compared the effectiveness of interventions delivered by different types of clinicians with interventions in which there were no clinicians (e.g., when there was no intervention or the intervention consisted of self-help materials only). Tobacco use treatments delivered by any single type of health care provider, such as a physician or other clinician (e.g., nurse, psychologist, dentist, or counselor), or by multiple clinicians, increase abstinence rates relative to interventions in which there is no clinician (e.g., self-help interventions). None of the studies in these analyses involved medication, but they did involve psychosocial intervention, principally counseling. Results are shown in Table 6.11. Results suggest that physicians and other clinicians are similarly effective in delivering tobacco cessation counseling. New research reviewed since the 2000 Guideline suggests that trained peer counselors also may be effective.²⁵¹⁻²⁵³

Number of Clinician Types. Thirty-seven studies met selection criteria for the 2000 analysis examining the effectiveness of multiple clinicians used in smoking cessation interventions. “Multiple clinicians” refers to the number of different *types* of clinicians (if a nurse and a physician each delivered parts of an intervention, two types of clinicians would be involved). Tobacco use treatments delivered by two or more types of clinicians increase abstinence rates relative to those produced by interventions in which there is no clinician (Table 6.12). However, the number of clinician types is confounded with treatment intensity. For instance, if an individual meets with a physician for a medication consultation and then talks to a health educator about the quit plan, that is two clinicians and two sessions. The number of contacts may be more important than the number of clinicians providing treatment.

Table 6.11. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for interventions delivered by different types of clinicians (n = 29 studies)^a

Type of clinician	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No clinician	16	1.0	10.2
Self-help	47	1.1 (0.9–1.3)	10.9 (9.1–12.7)
Nonphysician clinician	39	1.7 (1.3–2.1)	15.8 (12.8–18.8)
Physician clinician	11	2.2 (1.5–3.2)	19.9 (13.7–26.2)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Table 6.12. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for interventions delivered by various numbers of clinician types (n = 37 studies)^a

Number of clinician types	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No clinician	30	1.0	10.8
One clinician type	50	1.8 (1.5–2.2)	18.3 (15.4–21.1)
Two clinician types	16	2.5 (1.9–3.4)	23.6 (18.4–28.7)
Three or more clinician types	7	2.4 (2.1–2.9)	23.0 (20.0–25.9)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

■ Future Research

The following topics regarding type of clinician require additional research:

- Effectiveness of specific types of clinicians (e.g., quitline counselors, trained peer counselors, nurses, physician assistants, pharmacists, social workers)
- Relative effectiveness of various numbers and types of clinicians, with the intensity of the intervention held constant

■ Formats of Psychosocial Treatments

Recommendation: Proactive telephone counseling, group counseling, and individual counseling formats are effective and should be used in smoking cessation interventions. (Strength of Evidence = A)

Recommendation: Smoking cessation interventions that are delivered in multiple formats increase abstinence rates and should be encouraged. (Strength of Evidence = A)

Recommendation: Tailored materials, both print and Web-based, appear to be effective in helping people quit. Therefore, clinicians may choose to provide tailored self-help materials to their patients who want to quit. (Strength of Evidence = B)

Format Types. Overall format type (delivery mode) recommendations rest on the 2000 Guideline meta-analysis, although new focused analyses of proactive quitlines were conducted for the 2008 update. Fifty-eight studies met selection criteria and were included in the 2000 meta-analysis comparing different types of formats (see Table 6.13). Tobacco use treatment delivered by means of proactive telephone counseling/contact (quitlines, call-back counseling), individual counseling, and group counseling/contact all increase abstinence rates relative to no intervention.

Self-Help. The 2000 format meta-analysis also evaluated the effectiveness of self-help interventions (e.g., pamphlets/booklets/mailings/manuals, videotapes, audiotapes, referrals to 12-step programs, reactive telephone hotlines/helplines [see Glossary], computer programs/Internet, and lists of community programs). Interventions delivered by means of widely varied self-help materials (whether as stand-alone treatments or as adjuvants) appear to increase abstinence rates relative to no intervention in this particular analysis. However, the effect of self-help was weak and typically not significant across analyses conducted for the 2000 Guideline (see Tables 6.13 and 6.15).

Number of Formats. Fifty-four studies met selection criteria and were included in the 2000 meta-analysis comparing the number of format types used for tobacco use treatment. The self-help treatments included in this analysis occurred either by themselves or in addition to other treatments. Tobacco use treatment that used three or four format types was especially effective. Results of this analysis are shown in Table 6.14.

Self-Help: Focused Analyses. Because the format meta-analysis revealed self-help to be of marginal effectiveness, another analysis was undertaken in 2000 to provide additional, focused information on self-help. Studies were accepted for the 2000 analysis if the presence of self-help materi-

als constituted the sole difference in treatment arms. In the main format analysis, some treatment arms differed on factors other than self-help *per se* (e.g., intensity of counseling). The treatments that accompanied self-help material in the focused analysis ranged from no advice or counseling to intensive counseling. The results of this analysis were comparable to those in the larger format analysis (i.e., self-help was of marginal effectiveness).

For the 2000 Guideline analysis, 21 studies met selection criteria to evaluate the effectiveness of providing multiple types of self-help interventions (e.g., pamphlets, videotapes, audiotapes, and reactive hotlines/helplines). The results provide little evidence that the provision of multiple types of self-help, when offered without any person-to-person intervention, significantly enhances treatment outcomes (see Table 6.15).

Two final 2000 meta-analyses addressed the impact of self-help brochures *per se*. In one analysis, brochures were used as the only intervention. In the other analysis, self-help brochures were used in addition to counseling. In neither analysis did self-help significantly boost abstinence rates.

Table 6.13. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for various types of formats (n = 58 studies)^a

Format Number	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No format	20	1.0	10.8
Self-help	93	1.2 (1.02–1.3)	12.3 (10.9–13.6)
Proactive telephone counseling	26	1.2 (1.1–1.4)	13.1 (11.4–14.8)
Group counseling	52	1.3 (1.1–1.6)	13.9 (11.6–16.1)
Individual counseling	67	1.7 (1.4–2.0)	16.8 (14.7–19.1)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Table 6.14. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for number of formats (n = 54 studies)^a

Number of formats ^b	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No format	20	1.0	10.8
One format	51	1.5 (1.2–1.8)	15.1 (12.8–17.4)
Two formats	55	1.9 (1.6–2.2)	18.5 (15.8–21.1)
Three or four formats	19	2.5 (2.1–3.0)	23.2 (19.9–26.6)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

^b Formats included self-help, proactive telephone counseling, group, or individual counseling.

Table 6.15. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for number of types of self-help (n = 21 studies)^a

Factor	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No self-help	17	1.0	14.3
One type of self-help	27	1.0 (0.9–1.1)	14.4 (12.9–15.9)
Two or more types	10	1.1 (0.9–1.5)	15.7 (12.3–19.2)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Quitlines. Both the substantial growth in quitline research and the implementation of a national network of tobacco quitlines (available through 1-800-QUIT-NOW) led the 2008 Guideline Panel to identify quitline effectiveness as a topic deserving focused meta-analyses. Nine studies met selection criteria and were analyzed for the 2008 Guideline update comparing the effectiveness of a quitline intervention versus minimal or no contact or self-help materials. This differs from the 2000 meta-analysis (Table 6.13) in that the current analysis focused on study arms that used quitline intervention alone rather than telephone counseling that may have occurred with other types of interventions. For the purpose of this analysis, quitlines are defined as telephone counseling in which at least some of the contacts are initiated by the quitline counselor to deliver tobacco use interventions, including call-back counseling. Quitlines significantly increase abstinence rates compared to minimal or no counseling interventions (Table 6.16).²⁵⁴ In a second 2008 meta-analysis of quitlines, six studies were analyzed comparing the effect of adding quitline counseling to medication versus medication alone. The addition of quitline counseling to medication significantly improves abstinence rates

compared to medication alone (see Table 6.17). These analyses suggest a robust effect of quitline counseling and are consistent with a recent independent analysis²⁵⁴ and with the recently released Centers for Disease Control and Prevention's *Guide to Community Preventive Services*.⁹²

Table 6.16. Meta-analysis (2008): Effectiveness of and estimated abstinence rates for quitline counseling compared to minimal interventions, self-help, or no counseling (n = 9 studies)^a

Intervention	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
Minimal or no counseling or self-help	11	1.0	8.5
Quitline counseling	11	1.6 (1.4–1.8)	12.7 (11.3–14.2)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Table 6.17. Meta-analysis (2008): Effectiveness of and estimated abstinence rates for quitline counseling and medication compared to medication alone (n = 6 studies)^a

Intervention	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
Medication alone	6	1.0	23.2
Medication and quitline counseling	6	1.3 (1.1–1.6)	28.1 (24.5–32.0)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Individually Tailored and Stepped-Care Interventions. Recent research has focused on the use of individually tailored materials. Tailored materials are those that are designed to address smoker-specific variables, such as support sources, recency of quitting, and concerns about quitting. Tailored materials can either be print materials, such as letters mailed to patients, or Web-based materials such as interactive Web sites.^{238,242} Some applications of tailoring have been shown to be effective and to have broad reach.^{241,245,255,256} The Panel also considered the use of stepped-care interventions (see Glossary) and concluded that there is not enough evidence to recommend a stepped-care approach as a basis for tailoring.^{257,258} However, these approaches warrant future research.

Computerized Interventions. E-health or Internet interventions have the potential to be accessed by a large percentage of the smoking population, permit extensive tailoring of content to the tobacco user's needs or characteristics, and, due to low personnel costs, are likely to be inexpensive to deliver. Such interventions may be used as stand-alone or adjuvant treatments. These programs typically collect information from the tobacco user and then use algorithms to tailor feedback or recommendations. They also typically permit the user to select from various features, including extensive information on quitting, tobacco dependence, and related topics. Current applications permit multiple iterations of feedback, development and monitoring of a quit plan, and proactive e-mail prompts to users.^{259,260} Optimal features of Web site resources have not yet been identified; some sites may be confusing and may not exploit the tailoring potential of this medium.²⁶¹ Clearly, more research is needed to identify their optimal structures, features, and contents.²⁶²⁻²⁶⁵

E-health tobacco interventions generally have yielded positive results. In a recent review of the use of these interventions with adult tobacco users, Walters et al. found that 7 of 15 studies with adults reported significantly improved outcomes over control conditions.²⁵⁹ Hall et al. combined computerized individualized feedback designed to motivate smokers using principles of the Stages of Change model with six 30-minute sessions of counseling and the nicotine patch. This was compared with untailored self-help material. Significant improvement due to the more intensive treatment was found at 18-month followup.²⁶⁶ Strecher et al. compared a multifaceted Web-based intervention (tailored cessation guide based on cognitive-behavioral principles, a medication adherence intervention, tailored e-mails, and a behavioral support person) in concert with the nicotine patch. This was contrasted with the patch alone. Favorable outcomes were obtained at 3 months postquit.²⁴¹ Similar positive effects also have been reported for a population study using computer-generated reports based on the Stages of Change model²⁶⁷ and a Web site study offered in a worksite program.²⁶⁸ A study with adolescents²⁶⁹ reported positive results due to access to a complex intervention that comprised an interactive computer intervention, clinician advice, brief motivational interviewing, and telephonic booster sessions. The control condition was information about eating more fruits and vegetables. Null results with computerized or computer-tailored interventions also have been obtained (see, e.g., Velicer et al.²⁷⁰ and Aveyard et al.²⁷¹). Moreover, in many of the studies yielding positive results, the Web-based intervention is just one

element of a complex intervention, or is considerably more intense than the comparison intervention. Given the potential reach and low costs of such interventions, however, they remain a highly promising delivery system for tobacco dependence.

■ **Future Research**

The following topics regarding formats require additional research:

- Which combinations of formats are most effective
- Relative effectiveness of different types of self-help interventions, including computer-based interventions
- Effectiveness of tailoring
- Effectiveness of fax-to-quit programs and other programs designed to increase quitline use
- Effective features of Web-based interventions
- Effect of computer-delivered interventions as a format versus the effect of the content of the intervention
- Optimal methods to decrease barriers and increase the appeal and use of effective counseling treatments

■ **Followup Assessment and Procedures**

Recommendation: All patients who receive a tobacco dependence intervention should be assessed for abstinence at the completion of treatment and during subsequent contacts. (1) Abstinent patients should have their quitting success acknowledged, and the clinician should offer to assist the patient with problems associated with quitting (see Chapter 3C, For the Patient Who Has Recently Quit). (2) Patients who have relapsed should be assessed to determine whether they are willing to make another quit attempt. (Strength of Evidence = C)

If the patient is willing to make another quit attempt, provide or arrange additional treatment (see Chapter 3A, For the Patient Willing To Quit).

If the patient is not willing to try to quit, provide or arrange an intervention designed to increase future quit attempts (see Chapter 3B, For the Patient Unwilling To Quit).

All patients should be assessed with respect to their smoking status during followup clinical contacts. In particular, assessments within the first week after quitting should be encouraged.^{272,273} Abstinent patients should receive reinforcement for their decision to quit, be congratulated on their success at quitting, and be encouraged to remain abstinent (see Chapter 3C, Strategy C1). The existing evidence does not show that these steps will prevent relapse, but continued involvement on the part of the clinician may increase the likelihood that the patient will consult the clinician in later quit attempts should they be needed. Clinicians also should inquire about and offer to help the patient with potential problems related to quitting (see Chapter 3C, Strategy C2), such as significant weight gain or residual withdrawal symptoms.

Patients who have relapsed should again be assessed for their willingness to quit. Patients who currently are motivated to make another quit attempt should be encouraged to use a tobacco dependence intervention (see Chapter 3A, For the Patient Willing To Quit). Clinicians may wish to increase the intensity of psychosocial treatment at this time or refer the patient to a tobacco dependence specialist/program for a more intensive treatment if the patient is willing. In addition, medication should be offered again to the patient, if appropriate. If the previous quit attempt included medication, the clinician should review whether the patient used the medication in an effective manner and determine whether the medication was helpful. Based on this assessment, the clinician should recommend retreatment with the same medication, another medication, or a combination of medications (see Tables 6.26–6.28). Patients who have relapsed and are unwilling to quit at the current time should receive a brief intervention designed to increase future quit attempts (see Chapter 3B).

■ **Future Research**

The following topics regarding followup assessment and treatments require additional research:

- Optimal timing and types of relapse prevention interventions
- Effectiveness of various formats for relapse prevention treatments (e.g., effectiveness of telephone contacts in reducing the likelihood of relapse after a minimal intervention)

3. Treatment Elements

■ **Types of Counseling and Behavioral Therapies**

Recommendation: Two types of counseling and behavioral therapies result in higher abstinence rates: (1) providing smokers with practical counseling (problemsolving skills/skills training), and (2) providing support and encouragement as part of treatment. These types of counseling elements should be included in smoking cessation interventions. (Strength of Evidence = B)

Sixty-four studies met selection criteria for meta-analyses in 2000 to examine the effectiveness of interventions using various types of counseling and behavioral therapies. The results, shown in Table 6.18, reveal that four specific types of counseling and behavioral therapy categories yield statistically significant increases in abstinence rates relative to no-contact (i.e., untreated control conditions). These categories are: (1) providing practical counseling such as problemsolving/skills training/stress management; (2) providing support during a smoker's direct contact with a clinician (intratreatment social support); (3) intervening to increase social support in the smoker's environment (extratreatment social support); and (4) using aversive smoking procedures (rapid smoking, rapid puffing, other smoking exposure). A separate analysis was conducted eliminating studies that included the use of U.S. Food and Drug Administration (FDA)-approved medications. The results of this analysis were substantially similar to the main analysis.

Table 6.18. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for various types of counseling and behavioral therapies (n = 64 studies)^a

Type of counseling and behavioral therapy	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
No counseling/behavioral therapy	35	1.0	11.2
Relaxation/breathing	31	1.0 (0.7–1.3)	10.8 (7.9–13.8)
Contingency contracting	22	1.0 (0.7–1.4)	11.2 (7.8–14.6)
Weight/diet	19	1.0 (0.8–1.3)	11.2 (8.5–14.0)
Cigarette fading	25	1.1 (0.8–1.5)	11.8 (8.4–15.3)
Negative affect	8	1.2 (0.8–1.9)	13.6 (8.7–18.5)
Intratreatment social support	50	1.3 (1.1–1.6)	14.4 (12.3–16.5)
Extratreatment social support	19	1.5 (1.1–2.1)	16.2 (11.8–20.6)
Practical counseling (general problem-solving/skills training)	104	1.5 (1.3–1.8)	16.2 (14.0–18.5)
Other aversive smoking	19	1.7 (1.04–2.8)	17.7 (11.2–24.9)
Rapid smoking	19	2.0 (1.1–3.5)	19.9 (11.2–29.0)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

The 2008 Guideline Panel decided not to recommend extratreatment social support in the current Guideline update. This change was based on recent literature on extratreatment social support that does not show a strong effect for helping smokers identify and utilize support outside of the treatment relationship.^{274–276} Aversive smoking was recommended in the 2000 Guideline. However, new studies that have been conducted since the 2000 Guideline, including a Cochrane Review, cast doubt on the effectiveness of aversive smoking.²⁷⁷ Because of this and the side effects of this treatment, the Guideline Panel decided not to recommend the use of aversive smoking therapy in the 2008 update.

The strength of evidence for the 2008 Guideline update recommendations regarding practical counseling and intratreatment social support did not warrant an “A” rating for several reasons. First, the evidence reviewed indicated that tobacco use treatments rarely used a particular type of counsel-

ing or behavioral therapy in isolation. Second, various types of counseling and behavioral therapies tended to be correlated with other treatment characteristics. For instance, some types of counseling and behavioral therapies were more likely to be delivered using a greater number of sessions across longer time periods. Third, all of these types of counseling and behavioral therapies were compared with no-contact/control conditions. Therefore, the control conditions in this meta-analysis did not control for nonspecific or placebo effects of treatment. This further restricted the ability to attribute effectiveness to particular types of counseling and behavioral therapies *per se*. Fourth, the studies used in this analysis often tailored the types of counseling and behavioral therapies to the needs of specific populations being studied, thereby affecting the generalizability of the study results. Fifth, there was considerable heterogeneity within each type of counseling and behavioral therapy.

Tables 6.19 and 6.20 outline elements of practical counseling (problemsolving/skills training) and intratreatment social support, respectively. These tables are designed to help clinicians using these counseling and behavioral therapies. It must be noted, however, that these treatment labels are non-specific and include heterogeneous treatment elements. The effectiveness of encouragement and support as part of treatment is consistent with the literature regarding the importance of providing a caring, empathic, and understanding context in making other health behavior changes.²⁷⁸⁻²⁸⁰

Table 6.19. Common elements of practical counseling (problemsolving/skills training)

Practical counseling (problemsolving/skills training) treatment component	Examples
Recognize danger situations – Identify events, internal states, or activities that increase the risk of smoking or relapse.	• Negative affect and stress • Being around other tobacco users • Drinking alcohol • Experiencing urges • Smoking cues and availability of cigarettes
Develop coping skills – Identify and practice coping or problemsolving skills. Typically, these skills are intended to cope with danger situations.	• Learning to anticipate and avoid temptation and trigger situations • Learning cognitive strategies that will reduce negative moods • Accomplishing lifestyle changes that reduce stress, improve quality of life, and reduce exposure to smoking cues • Learning cognitive and behavioral activities to cope with smoking urges (e.g., distracting attention; changing routines)

Table 6.19. Common elements of practical counseling (problemsolving/skills training) (continued)

Practical counseling (problemsolving/skills training) treatment component	Examples
Provide basic information – Provide basic information about smoking and successful quitting.	• The fact that any smoking (even a single puff) increases the likelihood of a full relapse • Withdrawal symptoms typically peak within 1–2 weeks after quitting but may persist for months. These symptoms include negative mood, urges to smoke, and difficulty concentrating. • The addictive nature of smoking

Table 6.20. Common elements of intratreatment supportive interventions

Supportive treatment component	Examples
Encourage the patient in the quit attempt.	• Note that effective tobacco dependence treatments are now available. • Note that one-half of all people who have ever smoked have now quit. • Communicate belief in patient's ability to quit.
Communicate caring and concern.	• Ask how patient feels about quitting. • Directly express concern and willingness to help as often as needed. • Ask about the patient's fears and ambivalence regarding quitting.
Encourage the patient to talk about the quitting process.	Ask about: • Reasons the patient wants to quit. • Concerns or worries about quitting. • Success the patient has achieved. • Difficulties encountered while quitting.

Acupuncture. A separate meta-analysis was conducted in 2000 to evaluate the effectiveness of acupuncture. Evidence, as shown in Table 6.21, did not support the effectiveness of acupuncture as a tobacco use treatment. The acupuncture meta-analysis comparing “active” acupuncture with “control” acupuncture (see Glossary) revealed no difference in effectiveness between the two types of procedures. These results suggest that any effect of acupuncture might be produced by other factors such as positive expectations about the procedure. These results are consistent with the more recent Cochrane analysis.²⁸¹ Moreover, the Guideline Panel did not identify scientific literature to support the effectiveness of the more recent electrostimulation or laser acupuncture treatments for tobacco use.

Hypnosis. The 1996 Guideline did not conduct a separate meta-analysis on hypnosis because few studies met inclusion criteria, and those that did used very heterogeneous hypnotic procedures. There was no common or standard intervention technique to analyze. Literature screening for the 2000 Guideline revealed no new published studies on the treatment of tobacco dependence by hypnosis that met the inclusion criteria; therefore, this topic was not reexamined. Moreover, an independent review of nine hypnotherapy trials by the Cochrane Group found insufficient evidence to support hypnosis as a treatment for smoking cessation.²⁸² In contrast to the Cochrane Review and other reviews, a small recent study reported preliminary positive results with hypnotherapy.²⁸³

Other Interventions. The number of studies was insufficient to accurately appraise the effectiveness of other types of counseling and behavioral therapies, such as physiological feedback, restricted environmental stimulation therapy,²⁸⁴ and the use of incentives.²⁸⁵

Table 6.21. Meta-analysis (2000): Effectiveness of and estimated abstinence rates for acupuncture (n = 5 studies)^a

Treatment	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
Placebo	7	1.0	8.3
Acupuncture	8	1.1 (0.7–1.6)	8.9 (5.5–12.3)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

■ Future Research

The following topics regarding types of counseling and behavioral therapies require additional research:

- Effectiveness of motivational interventions, cigarette fading, and physiological feedback of smoking effects
- Mechanisms through which counseling interventions exert their effects
- Effectiveness of specific counseling interventions among various patient populations (e.g., those with cancers; chronic obstructive pulmonary disease [COPD]; psychiatric disorders, including substance use disorders; and atherosclerosis)

- Effectiveness of smokefree policies, particularly smokefree homes and worksites, on increasing interest in, and the effectiveness of, tobacco dependence treatment²⁸⁶
- Effectiveness of family systems interventions as a means to increase support

■ Combining Counseling and Medication

Recommendation: The combination of counseling and medication is more effective for smoking cessation than either medication or counseling alone. Therefore, whenever feasible and appropriate, both counseling and medication should be provided to patients trying to quit smoking. (Strength of Evidence = A)

Recommendation: There is a strong relation between the number of sessions of counseling, when it is combined with medication, and the likelihood of successful smoking cessation. Therefore, to the extent possible, clinicians should provide multiple counseling sessions, in addition to medication, to their patients who are trying to quit smoking. (Strength of Evidence = A)

Evidence in this Guideline update supports the independent effectiveness of both counseling interventions and medication interventions. In the 2008 Guideline update, the Panel evaluated whether combining counseling and medication improved cessation rates relative to using either of these treatments alone.

Providing Counseling in Addition to Medication. Eighteen studies met selection criteria to evaluate the effectiveness of providing counseling in addition to medication versus medication alone. The results of this 2008 meta-analysis indicate that providing counseling in addition to medication significantly enhances treatment outcomes (see Table 6.22). These same 18 studies also were analyzed to examine the relation of counseling intensity when it was used in combination with a medication. Results revealed that two or more sessions significantly enhance treatment outcomes, and more than eight sessions produced the highest abstinence rates (see Table 6.23). The counseling provided in these studies was delivered either in person or via telephone.

Table 6.22. Meta-analysis (2008): Effectiveness of and estimated abstinence rates for the combination of counseling and medication vs. medication alone (n = 18 studies)^a

Treatment	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
Medication alone	8	1.0	21.7
Medication and counseling	39	1.4 (1.2–1.6)	27.6 (25.0–30.3)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Table 6.23. Meta-analysis (2008): Effectiveness of and estimated abstinence rates for the number of sessions of counseling in combination with medication vs. medication alone (n = 18 studies)^a

Treatment	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
0–1 session plus medication	13	1.0	21.8
2–3 sessions plus medication	6	1.4 (1.1–1.8)	28.0 (23.0–33.6)
4–8 sessions plus medication	19	1.3 (1.1–1.5)	26.9 (24.3–29.7)
More than 8 sessions plus medication	9	1.7 (1.3–2.2)	32.5 (27.3–38.3)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Providing Medication in Addition to Counseling. The effect of adding medication to counseling also was examined. Nine studies met inclusion criteria and provided 24 arms to compare medication and counseling with counseling alone. The results of this 2008 meta-analysis indicate that providing medication in addition to counseling significantly enhances treatment outcomes (see Table 6.24).

Table 6.24. Meta-analysis (2008): Effectiveness of and estimated abstinence rates for the combination of counseling and medication vs. counseling alone (n = 9 studies)^a

Treatment	Number of arms	Estimated odds ratio (95% C.I.)	Estimated abstinence rate (95% C.I.)
Counseling alone	11	1.0	14.6
Medication and counseling	13	1.7 (1.3–2.1)	22.1 (18.1–26.8)

^a Go to www.surgeongeneral.gov/tobacco/gdlnrefs.htm for the articles used in this meta-analysis.

Medication and/or counseling are effective and should be provided as stand-alone interventions when it is not feasible to do both or the patient is not interested in both. By combining medication and counseling, however, the clinician can significantly improve abstinence rates. The clinician providing the medication does not need to be the clinician providing the counseling. It may be that a physician, dentist, physician assistant, or nurse practitioner could prescribe medicine, and counseling could be provided by a health educator, dental hygienist, tobacco treatment specialist, pharmacist, or quitline. Adherence to treatment, both medication and counseling, is important for optimal outcomes. Even though there is compelling evidence that both counseling and medications increase smoking cessation success, the clinician should encourage the patient to make a quit attempt even if she or he declines such treatment.

■ Future Research

The following topics regarding the combination of counseling and medication require additional research:

- Optimal timing and length of counseling and medication interventions (e.g., timing and spacing of postquit counseling sessions)
- Effectiveness and acceptability/appeal of different counseling formats and techniques (e.g., computer-based counseling, quitline counseling, motivational interviewing)
- Strategies to address misconceptions about effective counseling and medication treatments
- Relative cost-effectiveness of various treatment combinations

■ **For Smokers Not Willing To Make a Quit Attempt At This Time**

Recommendation: Motivational intervention techniques appear to be effective in increasing a patient's likelihood of making a future quit attempt. Therefore, clinicians should use motivational techniques to encourage smokers who are not currently willing to quit to consider making a quit attempt in the future. (Strength of Evidence = B)

Evidence suggests that a variety of motivational interventions can increase the motivation for behavior change. These interventions have varied contents and labels (e.g., individualized motivational intervention, motivational consulting, and motivational interviewing; see e.g., Chan et al.,¹⁷⁰ Butler et al.,¹⁷¹ and Brown et al.¹⁷³). The motivational intervention that has perhaps the greatest level of support and content specificity is motivational interviewing.

Motivational interviewing (MI) is a specific counseling strategy that is intended to increase a person's motivation for behavior change.¹⁶⁸ MI comprises a variety of strategies that are designed to help individuals resolve ambivalence about such change.¹⁷⁵ The technique has been used successfully to help individuals attempt and achieve many types of behavior change, including reduced drinking and illicit drug use, and reduction of HIV risk behaviors.^{175,287,288}

Several studies have shown that MI techniques appear to be effective in motivating smokers to make quit attempts. A randomized controlled trial of an MI-based intervention among 137 smokers with cancer found that MI significantly increased quit attempts compared to an advice condition.²⁸⁹ Another study found that a single session of MI, versus either brief psychoeducational counseling or advice, significantly increased the proportion of patients with schizophrenia who contacted a tobacco dependence treatment provider and attended an initial treatment session.¹⁷⁴ A third study showed that two 45-minute individual counseling sessions based on MI principles yielded higher levels of intention to quit smoking among adolescents than did a brief advice condition.¹⁷³ No differences in quitting attempts or quitting success were seen in that study, however. Studies that used motivational approaches that shared features of MI (but that were not

MI) yielded a mixed pattern of results, with some studies showing significant increases in quit attempts (see, e.g., Butler et al.¹⁷¹); others showed only trends in that direction.¹⁷⁰ Finally, one study that targeted unmotivated smokers showed that counseling based on the “5 R’s” (see Chapter 3, Strategy B2) significantly increased the odds of making a quit attempt that lasted at least 24 hours.¹⁶⁹

The available evidence shows that the reviewed motivational interventions such as MI increase quit attempts when used with individuals not already interested in quitting. The evidence does not show that such interventions are reliably effective as cessation treatments,^{173,175,290} nor is there consistent evidence that MI-induced quit attempts translate into higher long-term abstinence rates. Evidence also shows that such interventions are more effective in smokers with little pre-existing motivation to quit.^{171,173} Finally, some evidence suggests that extensive training is needed before competence is achieved in the MI technique.^{175,291}

Physiological Monitoring/Biological Marker Feedback To Motivate Smokers To Quit

Investigators have sought to determine whether feedback regarding either smoking effects or disease risk motivates quit attempts. Modest evidence indicates that such feedback motivates quit attempts.²⁹² One small study found that multifaceted feedback involving CO level, vital capacity measurement, and discussion of pulmonary symptoms led to more quit attempts among smokers identified during routine medical screening.²⁹³ In a second study, feedback regarding CO level and genetic susceptibility to cancer was associated with a greater likelihood of quit attempts 1 year later.²⁹⁴ Although these results are encouraging, there is too little information to evaluate definitively the effects of physiological feedback.²⁸⁴ In addition, there is insufficient information as to how this feedback affects those at different levels of readiness to quit. It also is unclear whether feedback that a person is *not* at high risk would encourage continued smoking. Finally, data are mixed regarding the effectiveness of feedback as a cessation versus motivational intervention. That is, data are mixed as to whether or not feedback increases abstinence rates.^{284,295,296}

Future Research

The following topics require additional research:

- Effectiveness of motivational interviewing and related techniques, including the impact of brief motivational interviewing strategies delivered in primary care settings
- Effectiveness of physiological monitoring and biological marker feedback to motivate smokers to quit and increase abstinence rates

B. Medication Evidence

Recommendation: Clinicians should encourage all patients attempting to quit to use effective medications for tobacco dependence treatment, except where contraindicated or for specific populations for which there is insufficient evidence of effectiveness (i.e., pregnant women, smokeless tobacco users, light smokers, and adolescents). (Strength of Evidence = A)

As with other chronic diseases, the most effective treatment of tobacco dependence requires the use of multiple clinical modalities. Medications are a vital element of a multicomponent approach. The clinician should encourage all patients initiating a quit attempt to use one or a combination of effective medications, although medication use may not be appropriate with some patient groups (e.g., those with medical contraindications, those smoking fewer than 10 cigarettes a day, pregnant/breastfeeding women, smokeless tobacco users, and adolescent smokers). The Guideline Panel identified seven first-line (FDA-approved) medications (bupropion SR, nicotine gum, nicotine inhaler, nicotine lozenge, nicotine nasal spray, nicotine patch, and varenicline) and two second-line (non-FDA-approved for tobacco use treatment) medications (clonidine and nortriptyline) as being effective for treating smokers. Each has been documented to increase significantly rates of long-term smoking abstinence. These results are consistent with other independent reviews.^{158,297-300} No other medication treatments were consistently supported by the available scientific evidence.

In this update, the Panel conducted an inclusive meta-analysis of medications that complements the inclusive meta-analysis of psychosocial interventions that was conducted for the 2000 Guideline. For this meta-analysis, all medication trials with at least two studies of a particular medication,