Smoking Cessation for Women: Evidence of the Effectiveness of Nursing Interventions

Ellen Giarelli, EdD, RN, CRNP

The association between cigarette smoke and disease is direct; cigarette smoking is a major cause of disease in the United States. More than 400,000 people die each year as a result of cigarette smoke. Smoking is responsible for almost 90% of all cases of lung cancer. Smoking cessation reduces the risk of lung cancer within five years. Cessation also may reduce the risk of other cancers, such as cancer of the head and neck, pancreas, and esophagus. Smoking causes skin wrinkling and sexual dysfunction, which can be mediated by smoking cessation. Even after a diagnosis of cancer, smoking cessation improves the odds of survival and reduces the risk of developing a second cancer.

The negative effects of tobacco use cross genders, races, and social strata, but morbidity and mortality from cigarette smoking is on the rise for women, who are vulnerable to the gender-specific risks of osteoporosis, hip fractures, and giving birth to babies with low birth weights and birth defects. The evidence is simple and clear: Smoking cessation promotes health and reduces morbidity and mortality from multiple diseases. Two factors may help reduce the prevalence of cigarette smoking: 79%–90% of smokers want to quit smoking, and 70% of smokers visit a healthcare professional each year (Cherry, Burt, & Woodwell, 2003; Coultas, 1991; Emmons & Goldstein, 1992). Nurses, as the largest group of healthcare providers nationwide, are involved in the majority of the visits and can have a significant effect on the reduction of tobacco use. Indeed, nursing interventions have been tested and proven to affect smoking cessation and prolong abstinence.

The purposes of this article are to present the evidence of the effectiveness of nursing-delivered smoking cessation interventions and to synthesize the findings to propose strategies to deliver nursing interventions that target women.

Sources of Data

A literature search was conducted to find studies of smoking cessation from 1991–2005 that used interventions provided by nurses. Databases used were MEDLINE, CINAHL®, and the Cochrane Library. A priori study hypotheses were that nursing-delivered smoking cessation interventions are more effective than no interventions and are more effective if they are more intense, include follow-up, and include aids that demonstrate the pathophysiologic effects of smoking. The studies had to have at least two treatment groups, and group assignment had to be randomized.

By far, the best source of data was the Cochrane Library, which described the comprehensive process for data extraction from published sources and statistical methods for pooling expected events from each trial. The Cochrane Library yielded specific reviews of nursing interventions for smoking cessation (Rice & Stead, 2004) and related reviews of telephone counseling for smoking cessation (Stead, Lancaster, & Perera, 2005), workplace interventions for smoking cessation (Moher, Hey & Lancaster, 2005), community interventions for preventing smoking among young people (Sowden, Arblaster, & Stead, 2003), and community interventions for reducing smoking among adults (Secker-Walker, Gnich, Platt, & Lancaster, 2002).

Studies Findings

The Cochrane Collaboration® analyzed findings from 29 trials of nursing interventions that were conducted from 1991–2005 in 10 countries with adults who were 18

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years of age and older and of either gender in any type of healthcare setting who used tobacco. Fourteen studies recruited participants from primary care or outpatient clinics. Eleven of the trials focused on hospitalized patients (Allen, 1996; Bolman, de Vries, & van Breukelen, 2002; Canga et al., 2000; Carlsson, Lindberg, Westin, & Israelsson, 1997; DeBusk et al., 1994; Feeney et al., 2001; Hajek, Taylor, & Mills, 2002; Lewis, Piascecki, Fiore, Anderson, & Baker, 1998; Miller, Smith, DeBusk, Sobel, & Taylor, 1997; Rigotti, McKool, & Shiffman, 1994; Taylor, Houston-Miller, Killen, & DeBusk, 1990). One study recruited employees during a workplace health check (Terazawa, Mamiya, Masui, & Nakamura, 2001). Two studies enrolled community-based adults who were motivated to quit (Alterman, Gariti, & Mulvaney, 2001; Davies, Matte-Lewis, O’Connor, Dulberg, & Drake, 1992). Only one study recruited patients while they were in the hospital but delivered the intervention after discharge (Rice et al., 1994).

Twelve studies focused on adults with diagnosed cardiovascular health problems, one studied patients with respiratory disease (Tonnesen et al., 1996), and one examined patients with diabetes (Canga et al., 2000). Three of the studies examined a smoking cessation intervention as a component of multiple risk factor reduction interventions in adults with cardiovascular disease (Allen, 1996; Carlsson et al., 1997; DeBusk et al., 1994; Hollis, Lichtenstein, Mount, Vogt, & Stevens, 1991; Terazawa et al., 2001). In six other studies, a nurse hired for the study delivered the intervention (Canga et al., 2000; Lewis et al., 1998; Miller et al., 1997; Rice et al., 1994; Rigotti et al., 1994; Taylor et al., 1990). A primary care or outpatient clinic nurse delivered the treatment in all of the low-intensity intervention studies.

### Effects of Intervention

The outcome used for a meta-analysis conducted by Moher et al. (2005) of the included studies was smoking cessation rather than reduction for the longest follow-up (six months and beyond). Definitions of abstinence ranged from single point prevalence to sustained abstinence by self-report. Meta-analysis produced heterogeneous results. For example, one trial had a significant negative effect of treatment (Rice et al., 1994), whereas three had large and significant positive effects (Canga et al., 2000; Taylor et al., 1990; Terazawa et al., 2001).

Twenty studies comparing a nursing intervention to a control or usual-care group found the intervention to significantly increase the odds of quitting, and evidence exists that interventions benefit hospitalized and nonhospitalized patients. Evidence supports more successful cessation with high-intensity than low-intensity interventions, and smokers who had experienced a disease crisis were more likely to quit. Repeated telephone support (Miller et al., 1997) increased cessation rates. In addition, the evidence does not support an effect of nurse counseling when smokers were invited to make appointments (Aveyard, Griffin, Lawrence, & Cheng, 2003).

### Table 1. Effects of Nursing Interventions on Smoking Cessation

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>POSITIVE EFFECT</th>
<th>NEGATIVE EFFECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advice given in the hospital</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Advice given in a clinic or outpatient setting</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Additional telephone support</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Physiologic feedback (e.g., carbon dioxide measurement)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Additional support: other</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Written materials</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Written quiz</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Offer of support buddy</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Self-help booklet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional sessions (two to four)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Brief advice integrated with health check</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Note: Treatments did not include pharmacologic agents such as nicotine patches.

### Nurse-Delivered Interventions for Smoking Cessation

A nursing intervention for smoking cessation is defined as the offering of advice, counseling, or strategies to help patients quit smoking. Clinical trials of nursing interventions include a control or usual-care comparison group. In such studies, advice is defined as verbal instructions from a nurse to stop smoking with or without information about the harmful effects of smoking. Interventions can be grouped into high or low intensity. A low-intensity intervention is one that provides advice during a single consultation lasting 10 minutes or less with one follow-up visit or no follow-up. A high-intensity intervention includes an initial consultation lasting longer than 10 minutes and materials such as manuals; participants have more than one follow-up contact. In the studies, the principle outcome was smoking cessation rather than reduction in withdrawal symptoms or reduction in cigarettes smoked. Follow-up was six months at minimum, and the criterion for abstinence was sustained cessation rather than point prevalence, which is a one-time measure of abstinence.

Of the high-intensity intervention studies, five used nurses, for whom the intervention was a core component of their role (Allen, 1996; Carlsson et al., 1997; DeBusk et al., 1994; Hollis, Lichtenstein, Mount, Vogt, & Stevens, 1991; Terazawa et al., 2001). In six other studies, a nurse hired for the study delivered the intervention (Canga et al., 2000; Lewis et al., 1998; Miller et al., 1997; Rice et al., 1994; Rigotti et al., 1994; Taylor et al., 1990).
None of the studies has been replicated to strengthen the science. Future studies should give more careful attention to sample size, participant selection, randomization, longer follow-up, and verification of outcomes using biochemical analysis of nicotine metabolites in urine or saliva cotinine, plasma cotinine levels, or expired carbon dioxide.

### Implications for Practice

Smoking cessation interventions can be effective for men and women in a variety of settings. The findings of Rice et al. (1994) are especially important regarding how nurses will address the needs of women who use tobacco. Additional analyses are needed to uncover why nursing interventions have a differential effect for men. Interventions designed specifically for women must be systematically standardized and then compared to isolate the most effective treatment modalities and intensities. Interventions for women may be designed with special attention to how the hazards of smoking have different meanings and impacts for women (see Table 3). For example, researchers could compare how a high-intensity intervention impacts women differently at various times in their menstrual cycles or examine whether smoking cessation is less effective among women at risk for depression or those who have eating disorders or chronic weight gain. For now, ample evidence exists that nursing interventions can increase smoking cessation.

Smoking-behavior monitoring and smoking cessation interventions can be incorporated into primary practice or routine care by nurses. Regardless of practice setting, nurses can give all patients an opportunity to discuss tobacco use, get advice and counseling, and receive reinforcement of health choices over time. The proven effective use of telephone counseling interventions may be combined with face-to-face primary care advice and counseling interventions to increase quit rates (Britt, Curry, McBride, Grothaus, & Louie, 1994; Lipkus, Lynch, & Rimer, 1999; McBride et al., 1999).

The U.S. Department of Health and Human Services (2000) offered guidelines for treating tobacco use and concluded that

### Table 2. Studies With Odds Ratios That Favored Treatment Groups

<table>
<thead>
<tr>
<th>STUDY AUTHOR AND SITE</th>
<th>INTERVENTION</th>
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<tbody>
<tr>
<td>Canga et al., 2000 Primary care</td>
<td>Individual counseling based on National Cancer Institute physician manual: 40 minutes, follow-up phone call, two further visits, and a letter</td>
</tr>
<tr>
<td>Carlsson et al., 1997 Inpatient</td>
<td>Multiple risk-factor interventions in secondary prevention unit: 1.5 hours of a smoking cessation component as part of nine hours of group or individual counseling plus four visits to a nurse during nine months</td>
</tr>
<tr>
<td>DeBusk et al., 1994 Inpatient</td>
<td>Multiple risk-factor interventions: case management system with smoking cessation, nutritional counseling, lipid-lowering therapy, and exercise therapy. Smoking cessation: two minutes with a physician, then nurse counseling with eight telephone follow-ups. Nicotine-replacement therapy was offered only to highly addicted patients who relapsed after discharge.</td>
</tr>
<tr>
<td>Feeney et al., 2001 Inpatient</td>
<td>Stanford Heart Attack Staying Free program: review by an alcohol and drug assessment (ADA) physician, self-help manual; patients at high risk for relapse were counseled on coping strategies and received audiotapes. On discharge, an ADA nurse contacted patients weekly for four weeks and at 2, 3, and 12 months.</td>
</tr>
<tr>
<td>Taylor et al., 1990 Inpatient</td>
<td>Nurse counseling on self-efficacy, benefits, and risks and a manual about coping with high-risk situations; further telephone counseling was provided as needed for as long as six months.</td>
</tr>
<tr>
<td>Terazawa et al., 2001 Workplace</td>
<td>14- to 20-minute stage-matched counseling by trained nurses; four follow-up calls for those willing to set a quit date at one week after the intervention and at three or four days, one month, and three months after cessation</td>
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2003; Lancaster et al., 1999). See Tables 1 and 2 for the most effective intervention strategies.

### Discussion

The literature provides modest scientific support for the use of nursing interventions for smoking cessation. Generally, when compared to control or usual-care groups, smokers who were offered advice or counseling by nurses had increased likelihood of quitting compared to smokers who did not receive nursing intervention. Structured cessation interventions were more effective than usual care on smoking abstinence at six months or longer after treatment. Generally, more benefit was gained by interventions with greater intensity. Evidence suggests that brief nurse-directed interventions that combine smoking cessation work with other activities or medical aims are not as effective as longer interventions delivered by nurses who have a regular role in health promotion and disease prevention.

Rice et al. (1994) found that, at one year, quitters were significantly more likely to be younger than 48 years of age, be male, have an individualized versus group or no cessation instruction, and have a high degree of perceived threat relative to their health states. Readers may deduce that women who smoke may not perceive themselves to be at great risk. Only two studies focused on female patients. Clinicians may lack unequivocal evidence to support using a specific nursing intervention for that cohort of patients. However, the preponderance of studies included both genders in their samples. Findings from the studies provide sufficient evidence to warrant claims that the effectiveness of the interventions is not gender specific and that interventions can be employed to affect smoking cessation in women regardless of diagnosis or health risk. Furthermore, even though patients with cancer were not singled out as subjects, findings from the study of patients with other chronic diseases (Rice et al.) are relevant. Patients with any chronic diseases must share necessary characteristics for successful cessation (e.g., desire to quit, perceived health risk). With that in mind, clinicians must review the work of Rice et al. to explore ways to increase women’s degree of perceived threat relative to health status.

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Table 3. Hazards of Smoking Cessation With Special Relevance for Women

<table>
<thead>
<tr>
<th>HAZARD</th>
<th>DETAILS</th>
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<tbody>
<tr>
<td>Symptoms of withdrawal</td>
<td>Peak in first three days; may include insomnia, irritability, frustration, anger, anxiety, difficulty concentrating, restlessness, and decreased heart rate; symptoms are worse if a cessation program is timed with menstruation or coincides with menopause.</td>
</tr>
<tr>
<td>Episodic craving may persist for months.</td>
<td>Worse if cessation program coincides with menopause or chronic social stress</td>
</tr>
<tr>
<td>Potential for mild depression</td>
<td>May require counseling or antidepressant therapy in addition to smoking cessation counseling</td>
</tr>
<tr>
<td>Weight gain</td>
<td>Typical gain of two to five pounds in the first two weeks, followed by four to seven pounds over the next four or five months; the average weight gain is 10 pounds. Smoking cessation programs are confounded by concurrent weight loss programs.</td>
</tr>
</tbody>
</table>

Note: Based on information from Sackey & Rennard, 2005.

all nonphysician healthcare providers are effective arbiters of health care for smoking cessation and that treatment from multiple clinician types has added benefit. The best science and most practical approach would be to investigate the effects of nurses giving brief advice in collaborative practice because that mode most closely approximates current practice in cancer care.

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References


