

# A Decision Aid to Improve Smoking Abstinence for Families Facing Cancer

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**P**ersistent cigarette smoking can compromise cancer treatment by affecting treatment effectiveness and complications, recurrence, risk of secondary malignancy, survival, and health-related quality of life (Browman et al., 2002; Dresler & Gritz, 2001; Mason et al., 2009; McDonnell, Bullock, Hollen, Heath, & Kozower, 2014; Parsons, Daley, Begh, & Aveyard, 2010; Warren, Kasza, Reid, Cummings, & Marshall, 2013). Many individuals diagnosed with cancer have a history of smoking, and many continue to smoke postdiagnosis (Cataldo, Dubey, & Prochaska, 2010; Underwood et al., 2012; Waller, Weaver, Petty, & Miller, 2010). When diagnosed with an acute illness, patients are more likely to comply with advice to stop smoking; however, few stop smoking without assistance, and family members who smoke are major barriers to success (Fiore et al., 2008; Hurt, Ebbert, Hays, & McFadden, 2009; McBride & Ostroff, 2003).

Cancer-related decisions require evaluating complex medical information in short time frames, with unfamiliar providers and in settings that may be far from home. Intense emotions during these situations may affect decision making. A decision aid (DA) improves knowledge, reduces decisional conflict, and results in decisions compatible with one's value system (O'Brien et al., 2009). The decision to stop smoking is difficult; some patients who smoke are unable to stop or repeatedly relapse after trying (Cooley et al., 2009). Targeting household members who smoke through a family-centered cessation plan may reduce a substantial barrier and lower the patient's relapse risk while improving overall family health.

The primary aim of this study was to determine the feasibility of implementing a clinic-based DA for patients scheduled for thoracic surgery and their family members who smoke. Participants were asked to consider three decisions: (a) Should I stop smoking prior to surgery? (b) Should we establish a smoke-free home? and (c) Should I stay smoke-free?

**Purpose/Objectives:** To test the feasibility of a multidisciplinary, multicomponent, theory-based decision aid.

**Design:** Prospective, one-group repeated measures.

**Setting:** Thoracic surgery clinic in a university hospital cancer center in central Virginia.

**Sample:** 8 dyads, consisting of 16 total participants.

**Methods:** A multidisciplinary, multicomponent smoking cessation intervention incorporated a theory-based decision aid. Enrollment occurred preoperatively; four face-to-face visits and an exit interview were conducted during six months.

**Main Research Variables:** Feasibility was evaluated based on four criteria: recruitment, retention, adherence, and acceptability.

**Findings:** The recruitment rate was 44%, and the retention rate was 100%. Adherence to the intervention and the acceptability of the decision aid were greater for patients than family members. Patients had greater abstinence than family members before surgery and at six months. Exit interview themes included (a) preoperative timing was acceptable and (b) involving household members who smoke was important.

**Conclusions:** Recruiting male patients and their female partners is feasible. Participants liked convenience, autonomy, and a family approach. Family members wanted more control over cessation timing and a more intensive approach to weight and mental health management. Successful dyads worked together to maintain abstinence.

**Implications for Nursing:** Oncology nurses can assess patients' and family members' smoking status, facilitate understanding about specific benefits of smoking cessation and the obstacle posed by household smokers, and make referrals to expert resources. Encouraging smoke-free environments is an important step toward reducing secondhand smoke exposure and promoting cessation.

**Key Words:** thoracic neoplasms; decision aid; tobacco use cessation; family intervention; dyads

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Modeled after "DecisionKEYS for Balancing Choices: Cancer Care," a DA series developed by Hollen et al. (2013) that promotes interactive decision making,

the DA intervention is based on Janis and Mann's (1981) conflict theory of decision making. This model predicts decision-making behavior for stressful and motivationally driven decisions, in which losses are perceived regardless of the path chosen. According to this theory, three preconditions (the amount of risk from consequences, hope for a better solution, and time pressure to make a serious decision) generate a degree of stress that affects one's decision-making style. The most effective range of stress is an intermediate one. Too little or too much stress negatively affects one's decision-making style. The style chosen results in quality or nonquality decision making, which leads to either decision satisfaction or regret (see Figure 1). Details regarding the theoretical development of the original DecisionKEYS appear in Hollen et al. (2013). Unique features of the DA include a brief presentation of the theory to study participants and the effect of the decision on themselves and others (Jones, Steeves, Ropka, & Hollen, 2013).

## Methods

A six-month prospective, one-group repeated measures design was used to measure intervention feasibility (based on the four criteria of recruitment, retention, adherence, and acceptability). Data were collected at four time points (i.e., preoperatively as a baseline, postoperatively prior to hospital discharge, one month postoperatively, and six months postoperatively). An exit interview was conducted. The study setting was a thoracic surgery clinic at a university hospital cancer center in central Virginia.

## Sample

A consecutive sample was recruited from clinic rosters during six months. All participants had to be aged at least 21 years and able to speak and read English. Patient eligibility criteria included (a) scheduled for surgery for a suspicious thoracic mass or known cancer, (b) smoked cigarettes within the past 60 days and was willing to consider stopping, and (c) had a household family member who smoked and was willing to invite that person to participate. Family members had to have

smoked cigarettes within the past 60 days and be willing to consider cessation.

Exclusion criteria included anyone who was (a) pregnant, lactating, or planning to become pregnant during the study or (b) taking theophylline, warfarin, haloperidol, or clozapine (because these drugs' pharmacokinetics are known to be altered by smoking cigarettes and smoking cessation, and the additional required monitoring was beyond the scope of this study) (Kroon, 2007). The thoracic surgery team assessed all patients' and family members' self-reported smoking statuses during a preoperative visit.

## Intervention and Procedures

Approval was obtained from the Institutional Review Board for Health Sciences Research at the University of Virginia in Charlottesville. Each participant gave written consent to participate in the study.

The multidisciplinary, multicomponent smoking cessation intervention was based on the clinical practice guideline from the U.S. Department of Health and Human Services (Fiore et al., 2008). After determining smoking statuses, a thoracic surgery team member delivered brief (three- to five-minute) smoking cessation counseling, which included three of the "5 A's" model for treating tobacco use (i.e., ask, advise, and assess).

The DA included a decision-making tutorial (a simplified one-page graphic handout and a CD for home use) and decision balance sheets (DBSs), both delivered face-to-face by the study coordinator. During each study visit, the graphic handout (Decision-Making Guide) of the conflict model of decision making was used to help participants understand parts of the theory, including quality decision making and decision satisfaction or regret (see Table 1). In addition to this diagram, dyads were given a CD entitled *Decision-Making Guide: Theory of Better Decision Making* (Hollen, 2005), along with a CD player for review at home.

The DA used the balance sheet concept designed by Janis and Mann (1981) to facilitate decision making with regard to three decisions: (a) Should I stop smoking prior to surgery? (b) Should we establish a smoke-free home? and (c) Should I stay smoke-free?



**Figure 1. Theory of Better Decision Making**

Note. From "Decision Making and Risk Behaviors of Cancer-Surviving Adolescents and Their Peers," by P.J. Hollen and W.L. Hobbie, 1996, *Journal of Pediatric Oncology Nursing*, 13, p. 14. Copyright 1996 by Sage Publications. Adapted with permission.

Weighing benefits and risks for oneself and others results in values clarification (see Figure 2). Each DBS used the same format, but value statements varied based on the three decisions, and patients' and family members' sheets differed slightly as well. Based on the DecisionKEYS model (Hollen et al., 2013), the primary author drafted the DBS content. The sheets were then finalized following several rounds of feedback, which included ratings by panels of experts in decision making, smoking cessation, and thoracic surgery.

Each dyad received the smoking cessation program booklet *Smoke-Free and Living It™* (Mayo Clinic, 2009). Short counseling sessions (four face-to-face sessions delivered in the hospital or clinic setting and up to six optional booster communications delivered remotely via telephone and/or the Internet) were administered by a study coordinator, an oncology-certified nurse with training as a tobacco treatment specialist, who provided additional information about nicotine dependence, quit date preparation, withdrawal symptom and trigger management, smoking cessation medications, weight control, exercise, stress management, and relapse prevention.

A longitudinal study requires a commitment to communication over time (Codday et al., 2005; Lengacher et al., 2001). Four face-to-face visits that lasted about 45 minutes were conducted jointly with dyads. In addition, optional booster communications that lasted less than 15 minutes were offered. Administered remotely, boosters aimed to facilitate communication, provide support, assess abstinence, and maximize retention on a monthly basis. Boosters used a traditional format via telephone as well as a more novel approach in the form of an interactive, password-protected website ([www.tobaccofreefamily.com](http://www.tobaccofreefamily.com)). Because a computer was not required for participation, online interaction was optional. Face-to-face visits were conducted with dyads together, but the boosters and exit interviews were done with participants one-on-one.

In anticipation that many participants would be concerned with stress management, a meditation CD was provided as an example of a strategy for managing stress (Hansen, 2014). The clinical practice guideline (Fiore et al., 2008) recommends medications for anyone trying to stop smoking, except when contraindicated or lacking evidence of effectiveness. Seven first-line, U.S. Food and Drug Administration–approved medications “reliably increase long-term smoking abstinence rates” (Fiore et al., 2008, p. vii); therefore, medication was a part of the intervention. The thoracic surgery team handled medication management with their patients. Family members were advised to consult their healthcare providers for prescriptions and medication management. Each dyad received the Mayo Clinic’s (2009) booklet *Medications to Help You Stop Using To-*

**Table 1. Tobacco-Free Family Intervention**

Component	Timing
Brief smoking cessation counseling by a surgeon or team member	Preoperatively
<b>Tobacco-Free Family Decision Aid</b>	
• Brief decision-making tutorial	Preoperatively
– Decision-Making Guide: A one-page graphic handout	
– <i>Decision-Making Guide: Theory of Better Decision Making</i> CD and CD player	
• Decision balance sheets	
– Should I stop smoking before surgery?	Prior to hospital discharge
– Should I establish a smoke-free home?	One month postoperatively
– Should I stay smoke-free?	Six months postoperatively
<i>Smoke-Free and Living It™</i> program	Preoperatively/ongoing
Stress management meditation CD	Preoperatively/ongoing
Medication management	Preoperatively/ongoing

*bacco™* to facilitate conversations and decision making with providers.

## Instruments

A **family information form** captured demographic and personal information. Readiness to quit smoking and confidence were assessed by asking participants to rate their response to the following two items: (a) How important do you think it is for you to stop smoking now? and (b) How confident are you that you can stop smoking now? on a 10-point scale from 0 (not at all) to 10 (very important and very confident). A **feedback form** was used during all face-to-face and booster interactions to measure adherence. An acceptance evaluation questionnaire, developed by P.J. Hollen (personal communication, July 9, 2009) to measure acceptance using a five-point, Likert-type scale, was adapted with permission and administered during all face-to-face interactions. Nicotine dependence, family function, and decision-making quality were measured during the preoperative visit and used as baseline characteristics of the study sample.

The **Fagerström Test for Nicotine Dependence** is a six-question test that measures nicotine dependency. Scores range from 0–10, with a higher score indicating greater dependence (Heatherton, Kozlowski, Frecker, & Fagerström, 1991). Test-retest data from eight studies reportedly ranged from 0.65 (smokers with schizophrenia) to 0.91 (general smokers). In 14 studies,

**Balance Sheet for Personal Decision Making**  
**Decision 1: Stop Smoking Before Surgery (Patient Version)**

It may help you to talk about difficult decisions with your healthcare team. You may want to write down your thoughts about what you personally value to help with your decision to stop smoking before surgery.

**Instructions**

1. Please put a **check** in the box next to the statements that are **important to you** for this decision.
2. Please review all boxes you checked and put a **star** next to those statements that are **most important to you**. Be sure to identify these for yourself and for others you care about. If there are other areas of importance to you, please add them to the list. If any statement is unclear to you, be sure to ask the study coordinator to clarify.
3. Write your decision preference below.

According to research, stopping smoking before surgery has substantial health benefits. Patients who stop smoking before surgery are more likely to stop smoking forever. My thoracic surgeon is advising me to stop smoking prior to my surgery. **If I stop smoking, what are the benefits and the risks?**

Person Involved	Benefits for Myself	Risks for Myself
Myself	<input type="checkbox"/> I will be able to breathe better. <input type="checkbox"/> I will have fewer complications during and after my surgery. <input type="checkbox"/> Healing from my surgery will be improved. <input type="checkbox"/> I will have a shorter hospitalization. <input type="checkbox"/> I may never need thoracic surgery again. <input type="checkbox"/> I may live longer. <input type="checkbox"/> Other <b>benefits</b> for myself: _____	<input type="checkbox"/> I may not be able to stop smoking. <input type="checkbox"/> I will miss smoking. I enjoy it. <input type="checkbox"/> I can't afford the costs of stop-smoking medication. <input type="checkbox"/> Stopping smoking may make me feel sick. <input type="checkbox"/> Stopping smoking will create tension for me with my family and friends who smoke. <input type="checkbox"/> Stopping smoking will be too stressful for me at this time. <input type="checkbox"/> Other <b>risks</b> for myself: _____
	<th>Benefits for Others</th> <th>Risks for Others</th>	Benefits for Others
Others	<input type="checkbox"/> My family will feel more hopeful for me after my surgery. <input type="checkbox"/> My stopping smoking will help my family members who smoke to stop smoking. <input type="checkbox"/> Others close to me will suffer if I became very ill from smoking. <input type="checkbox"/> Others will not get sick from my cigarette smoke. <input type="checkbox"/> The young people in my family will have a healthier role model. <input type="checkbox"/> Other <b>benefits</b> for people I care about: _____	<input type="checkbox"/> Smoking friends and family may not be comfortable around me. <input type="checkbox"/> Family members who smoke may not be supportive. <input type="checkbox"/> Stopping smoking will disrupt my usual routines. <input type="checkbox"/> Friends and family members like me better when I am happily smoking than when I am miserable trying to quit. <input type="checkbox"/> Other <b>risks</b> for people I care about: _____
Decision preference: _____		

**Figure 2. Example of a Decision Balance Sheet**

the Cronbach coefficient ranged from 0.55–0.74, indicating moderate internal consistency.

Overall functioning is measured by the **McMaster Family Assessment Device (FAD)**, version 3.0, using only the 12-item subscale, **General Family Functioning Scale (GFFS)**. Scores on the GFFS range from 1–4, with lower scores indicating healthier family functioning (Epstein, Baldwin, & Bishop, 1983). In a sample of 503 adults,

294 of which came from 112 families managing a variety of chronic medical illnesses, the coefficient alpha for the GFFS was 0.92, indicating high internal consistency. Reliability data is based on a sample of 45 individuals tested at one-week intervals. The resultant test-retest coefficient was 0.71 (Sawin & Harrigan, 1995).

The **Decision-Making Quality Scale (DMQS)** assesses adherence to seven quality decision-making

criteria using a four-point Likert-type rating scale. Scores range from 0–21, with 15 or higher representing higher quality decision making (Hollen, 1994). Content validity was established by a panel of three experts whose teaching and research relate to decision theory. A high rate of agreement was found among experts in the DMQS content areas of adherence to theory, domain representation, and item proportionality. Internal consistency with Cronbach alpha coefficients (0.76–0.86) was high for two cohorts of healthy high school students and adults (Hollen, 1994).

The **Smokerlyzer™** (Bedfont Scientific, Ltd.) is a carbon monoxide analyzer that verifies tobacco use. It was used twice in the postoperative period to confirm smoking status of all participants. The cutoff value for nonsmokers is 7 pm, and readings above that level indicate a lack of abstinence from cigarette smoking.

A semistructured interview guide was used to obtain participants' narratives about their experiences with decision making and smoking cessation during this study. The audiorecorded exit interviews lasted 45–60 minutes.

## Data Analysis

Quantitative analyses were conducted using SPSS®, version 20.0. Descriptive statistics were used for the characteristics of the study sample, recruitment, retention, adherence, perceptions of acceptability, and decision preferences. The sample size precluded the use of inferential statistics and dictated a conservative interpretation. The exit interview data were reviewed to identify common themes.

## Results

At the preoperative visit, five patients had a known cancer, and three had a suspicious thoracic mass. Postoperatively, two patients were diagnosed with benign disease. The other six patients were diagnosed with lung cancer, lymphoma, or esophageal cancer; lung cancer was the most common diagnosis ( $n = 4$ ). All participants were Caucasian; all enrolled patients were male, and all family members were female (see Table 2). Other types of family members who lived with eligible patients (husbands, siblings, parents, adult children) declined participation; therefore, those dyads were not enrolled. Most participants ( $n = 13$ ) reported an annual income of less than \$50,000. The dyad with the fewest collective education years reported an annual income of less than \$4,000. The majority of dyads ( $n = 6$ ) lived in homes with no indoor smoking restrictions.

All participants denied ever attempting to stop smoking with a family member. On average, upon enrollment, all participants rated stopping smoking as very important. Family members were less confident than patients

**Table 2. Sample Characteristics (N = 16)**

Characteristic	Patients (n = 8)	Family Members (n = 8)		
	n	Median	Range	
<b>Gender</b>				
Female	–		8	
Male	8		–	
Married	6		6	
Completed high school	5		7	
Income less than \$25,000	5		3	
Characteristic	Median	Range	Median	Range
Age (years)	58	–	49	–
Importance of stopping smoking <sup>a</sup>	10	3–10	10	5–10
Self-confidence <sup>a</sup>	8.5	4–10	6.5	4–10
Characteristic	$\bar{X}$	SD	$\bar{X}$	SD
Family function	1.7	0.5	1.8	0.2
Decision-making quality	14.1	2	14.3	2.3
Nicotine dependence (FTND <sup>b</sup> )	6.8	1.2	5.3	1

<sup>a</sup> Range = 0–10  
<sup>b</sup> FTND score differences between patients and family members were statistically significant ( $p \leq 0.05$ , paired sample t-test).  
 FTND—Fagerström Test for Nicotine Dependence

of their ability to stop. The mean FAD scores indicated healthy family functioning, and participants' decision-making quality bordered on high. All participants were rated moderately dependent on nicotine, with patients being significantly more dependent ( $p < 0.009$ ).

## Feasibility Results

During the six-month recruitment period, 50 individual patients who smoked were screened; only 18 families were eligible and were approached to participate. Of those 18 eligible dyads, only one dyad included a female patient; however, that patient's spouse was not interested in enrollment. Eight dyads (eight male patients and eight female spouses or partners; 16 participants total) consented to enroll (44% recruitment rate). A 100% retention rate was realized.

Adherence was measured by (a) setting a quit date, (b) attending face-to-face study visits, (c) using recommended medications, (d) participating in at least four booster communications, and (e) participating in Smokerlyzer analyses to verify smoking status (see Table 3). All patients were willing to set a quit date, but only half ( $n = 4$ ) of family members were willing to set one. Face-to-face study visits had high adherence. Three patients and two family members opted not to use medication because

of “fear of taking additional medications” or “strong determination to stop smoking.” Other participants used nicotine replacement therapy combinations (e.g., patch, gum, lozenge, inhaler) and varenicline. Overall, five patients and two family members participated in at least four optional boosters. Fatigue, varying work schedules, and disinterest (among family members) were the most common reasons for not participating in boosters. Only three dyads had a working computer in their home. Three family members accessed the study website more than once. All participants agreed to verify their smoking status by a Smokerlyzer test.

A majority of participants agreed that strong encouragement to stop smoking motivated them to do so (see Table 4). A majority agreed that involving family members who smoke was important. In rating the DA components, a majority of participants rated the Decision-Making Guide as helpful. In addition, a greater majority of patients rated the CD home module as helpful compared to family members. The participants rated the DBSs as “easy to read, easy to use, and acceptable in terms of time needed to complete.” Most importantly, the DBS for the decision to stop smoking before surgery was rated highly by patients as an aid for communication with their doctors and family members. However, as the decision context changed to long-term smoking abstinence, the DBS did not enhance communication. A majority of participants said they would recommend this DA to others.

All patients stopped smoking before surgery compared to only two family members. A majority of dyads (n = 5) established smoke-free homes. At the study’s end, more patients than family members remained smoke-free. Two dyads were smoke-free at six months.

### Exit Interviews

All participants were interviewed. Major themes included (a) preoperative timing of the intervention was

convenient and acceptable and (b) involving household family members who smoke was important. Participants anticipating thoracic surgery described positive feelings about the enrollment timing. One dyad stated, “We were excited to hear about the program and hoped that it would help us stop smoking.” One family member said, “Maybe this is the motivation I need. I would love to be smoke-free.” Her spouse said, “I had a very negative attitude after hearing that I needed another surgery for another cancer. The timing was good.” One patient with a history of a liver transplantation and chronic obstructive pulmonary disease promised his surgeon to stop smoking; he stated, “My surgeon told me that I was a high-risk surgical candidate. He encouraged me to hear about this program. I knew he was serious.” One family member who stopped smoking immediately after enrollment and established a smoke-free home said, “I don’t want to end up like my husband, and I want to make sure that he stays as healthy as possible.”

Involving family members who smoke was important because dyad members supported each other. One patient with disabling heart disease stated, “I was confident I could stop smoking this time, knowing that we were both going to quit together. We very seldom do anything without each other.” His spouse stated, “At first, I was very skeptical. I thought I couldn’t do it. But overcoming this together gave us the needed support. I’m confident now that we will stay smoke-free.” One family member realized that her pride in her ability to stop smoking was undermining her husband’s confidence as he struggled to stay smoke-free. With assistance, she developed strategies to show him greater support.

Patients were supportive of family members’ struggles with smoking cessation. One patient, whose spouse was a cancer survivor, stated, “I was disappointed at first, but my wife dramatically reduced her smoking from one and a half packs of cigarettes a day to three to four. I’m proud of her. I think she will be able to stop for good when all of my chemotherapy treatments are over. She is too stressed now.” Another patient stated, “My girlfriend is a very heavy smoker and just not ready to stop.” One patient who stopped smoking without medication stated, “Everyone has to find their own way. My wife smokes two to three packs of cigarettes every day. She had a lot of success using varenicline. She’ll do it. She has a lot of support.” At the end of the study, several patients who stopped smoking expressed a strong desire to help their family members stop smoking.

Other nonenrolled relatives were not supportive, and participants considered additional strategies to combat their potentially negative influence. One dyad established a smoke-free home immediately. They placed an “oxygen in use” sign on their front door to minimize difficult conversations because they have many friends and relatives who smoke. Another dyad lived with a

**Table 3. Factors Related to Study Adherence (N = 16)**

Factor	Patients (n = 8)	Family Members (n = 8)	Total
	n	n	n
Set a quit date	8	4	12
Face-to-face visits	8	7	15
Medication use <sup>a</sup>	5	3	8
Booster communication	5	2	7
Smokerlyzer™ CO testing	8	8	16

<sup>a</sup>Medication use included any of the seven U.S. Food and Drug Administration–approved medications for smoking cessation. CO—carbon monoxide

retired parent who smokes and who reminded the dyad that it was impossible for them to stop smoking. The family member stopped smoking for two weeks before relapsing. Another family member stated, "When you constantly hear negative messages, you begin to believe them. When you are feeling vulnerable, negative people have a bigger effect. When I set my next quit date, I plan to avoid them."

## Discussion

Although family members are an important source of support for patients with cancer, they are seldom included in research studies. However, according to the conflict theory of decision making and previous studies, important health decisions are seldom made by patients alone (Janis & Mann, 1981; Northouse, Kershaw, Mood, & Schafenacker, 2005; Northouse et al., 2006). In the case of smoking cessation, one person's decision affects the health of others. Conflicting evidence exists, but some studies suggest that couples who initiate positive lifestyle changes together may be more likely to achieve and maintain new behaviors (Falba & Sindelar, 2007; Franks, Pienta, & Wray, 2002; Shoham, Rohrbaugh, Trost, & Muramoto, 2006). In this study, only two female patients were eligible, but the spouse and adult son of these patients were not interested in smoking cessation. Other female patients lived alone and were not eligible for enrollment. Like in previous studies, other types of family members (parents, adult children, siblings) declined to participate (Bottorff, Robinson, Sullivan, & Smith, 2009; Cooley et al., 2007; Robinson, Bottorff, Smith, & Sullivan, 2010).

Despite initial concerns that recruiting during the preoperative period would be too stressful, participant consensus was that the timing was convenient. Most participants described the timing as "ideal" or "perfect," which aligns with findings from Luftman et al. (2011). The refusal rate was greater than anticipated but similar to other studies reporting refusal rates among adults with a new lung cancer diagnosis, as well as in a smoking cessation pilot study targeting thoracic surgery patients (Cooley et al., 2003; McCorkle, Packard, & Landenburger, 1984; Park et al., 2011). Studies recruiting dyads are shown to have higher refusal rates, so this evidence should be considered when designing recruitment plans (Bastian et al., 2011; Northouse et al., 2006; Motzer, Moseley, & Lewis, 1997; Quinn, Dunbar, Clark, & Strickland, 2010).

The 100% retention rate and excellent attendance at face-to-face visits can be attributed to the study design, which maximized convenience and offered three financial compensations, which totaled \$150 per participant over six months. This successful retention rate was greater than reported by other researchers targeting

**Table 4. Number of Participants Who Agreed or Strongly Agreed With Statements Regarding the Decision Aid (N = 16)**

Statement	Patients (n = 8)			Family Members (n = 8)		
	1 <sup>a</sup>	2 <sup>b</sup>	3 <sup>c</sup>	1 <sup>a</sup>	2 <sup>b</sup>	3 <sup>c</sup>
Strong encouragement motivated me.	8	6	7	5	6	4
Involving family members who smoke in my home is important.	8	8	7	7	7	5
The Decision-Making Guide was a helpful review of quality decision making.	6	7	6	7	5	5
The CD home module, <i>Theory of Better Decision Making</i> , was helpful.	6	7	6	4	4	4
The decision balance sheets were helpful.	5	3	5	3	4	3
Overall, the decision aid was helpful.	7	6	7	6	5	3
The decision aid helped me speak with my doctor about my personal values.	8	5	5	4	4	5
The decision aid helped me speak with my family member about stopping smoking.	7	6	3	4	4	4
I would advise others to use this decision aid.	8	8	6	6	5	6

<sup>a</sup> Decision 1: Stop smoking before surgery (made preoperatively).

<sup>b</sup> Decision 2: Establish a smoke-free home (made during hospitalization).

<sup>c</sup> Decision 3: Stay smoke-free (made postoperatively).

thoracic surgery populations (Kozower et al., 2010; Luftman et al., 2011; Park et al., 2011).

Setting a quit date is an important initial step in planning to stop smoking, and a majority of participants set one. Only half of the family members set a quit date. Regardless of the time frame between enrollment and surgery, stopping smoking before surgery worked for patients but not for most family members supporting them.

Boosters were designed as a retention strategy; however, they were challenging to schedule, primarily because of participants' fatigue, work schedules, or eventual disinterest in smoking cessation. Two patients received chemotherapy or radiation therapy prior to surgery while continuing full-time employment. Telephone contact improved during postsurgery recovery at home. A majority of patients returned to full-time work after surgery. The challenges of communicating

remotely did not negatively affect the retention rate but may have affected abstinence rates.

Overall acceptance of the DA was higher among patients than among family members. This level of acceptance is similar to other patient populations' receptiveness to DAs targeting treatment and screening decisions (Hollen et al., 2013; Stacey, Samant, & Bennett, 2008). In exit interviews, participants agreed that parts of the DA helped them to reflect on their health and the value of smoking cessation at that time. This positive response correlates with other evidence of the value of the interactive decision-making approach (Jones et al., 2012).

Patient abstinence rates exceeded the benchmarks in the literature. A recent meta-analysis reported six-month abstinence rates ranging from 8%–30% for patients with a variety of cancers (Nayan, Gupta, Strychowsky, & Sommer, 2013). However, lower six-month abstinence rates have been reported in a study conducted with family members of patients diagnosed with lung cancer (Schilling et al., 1997). In this study, five patients and two family members remained abstinent after six months for a total of seven participants. In the exit interviews, only two dyads reported developing substantial mutual strategies to support their abstinence. A majority of dyads established smoke-free homes, which a study by Shields (2007) indicated may eventually lead to smoking cessation. In that study, smoking bans at work and home were associated with increased attempts to stop smoking.

## Limitations

This study had several limitations. Some thoracic surgery team members inconsistently provided the brief counseling component of the intervention because engaging family members in brief counseling is not part of these providers' usual care. In addition, boosters were not used by all participants, resulting in intervention dose variability. A small sample size because of the refusal rate and a short recruitment period further limited data and analysis. As a feasibility study, the results provide insight for strengthening fidelity in future studies (Santacroce, Maccarelli, & Grey, 2004). A research study orientation session typically involves instruction about study procedures. Incorporating greater structure in the intervention (e.g., protocol checklists, formalized coaching with team members regarding smoking status assessment, routine encouragement of smoking cessation with patients and family members) may strengthen fidelity. To maximize sample size and diversity, future studies should consider a longer recruitment period and multiple sites.

## Implications for Nursing

Oncology nurses in clinical settings can assess patients' and family members' smoking statuses, fa-

## Knowledge Translation

Encouraging patients with cancer and their partners who are current smokers to stop smoking may motivate them to stop smoking together.

Female partners wanted a more comprehensive approach to help manage other health issues such as anxiety, depression, and obesity.

Establishing a smoke-free home environment may be a difficult decision, but it promotes smoking cessation and lessens smoking relapse.

cilitate an understanding of the benefits of smoking cessation specific to current treatment and the obstacle posed by household smokers, and refer those willing to stop smoking to expert resources. Family members often lack an understanding about the impact of their smoking on patients' health and ability to remain abstinent (Gritz, Nisenbaum, Elashoff, & Holmes, 1991). Encouraging smoke-free homes is an important step toward reducing exposure to secondhand smoke and promoting smoking cessation. Oncology nurses can influence clinical practice and policy so that a smoking status assessment and brief intervention for patients and their families are integrated as a standard of care.

Limited research exists regarding family receptivity to smoking cessation and risk-reducing behavioral change when a member is diagnosed with cancer. Findings suggest that a couple-based intervention that maximizes convenience and autonomy and targets multiple behaviors may be more effective than a patient intervention that targets only smoking cessation.

## Conclusions

This feasibility study suggests that a smoking cessation intervention is feasible for male patients and their female partners in the preoperative setting. The DA is acceptable. Participants who continued to smoke did not rate the DA as helpful. Despite study limitations, themes emerging from the exit interviews provide important insights regarding intervention timing and the involvement of household members. The findings indicate that patients and their partners are receptive to preoperative intervention, but they need and want convenience, autonomy, and a family approach. Intervention timing needs to be individualized, and efforts related to weight, stress, and mental health management should be intensified.

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