

# Perioperative Tobacco Interventions by Chinese Anesthesiologists

## *Practices and Attitudes*

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### ABSTRACT

**Background:** The prevalence of cigarette smoking in China is high. Surgery provides an excellent opportunity for patients to quit smoking, and anesthesiologists can play an important role in tobacco control. However, little is known about the practices, knowledge, and attitudes of Chinese anesthesiologists regarding perioperative tobacco interventions.

**Methods:** Chinese anesthesiologists were surveyed at a national meeting in 2009, with written questionnaires distributed to 800 practicing anesthesiologists.

**Results:** The survey response rate was 60.3%, and 10% of respondents themselves smoked cigarettes. Most (73%) of them frequently or almost always asked about smoking status; 51% advised about the health risk of tobacco use; and 60% advised patients to quit. Compared with nonsmokers, smokers were significantly less likely to advise about the health risks of smoking and quitting. A high proportion of respondents had accurate perceptions of perioperative and long-term health risks of smoking. Although most respondents agreed that advising patients to quit is the responsibility of anesthesiologists and the perioperative period is a good time to help patients quit smoking, few knew how to counsel about smoking or help patients get the help they needed to quit. Nonetheless, most of the respondents were willing to learn about perioperative interventions and spend an extra 5 min to help patients quit smoking.

**Conclusions:** Given their adequate knowledge of health risks of smoking, strong perception of responsibilities, and willingness to participate in tobacco control, Chinese anesthesiologists are poised to play a significant role in tobacco control in China that could improve perioperative outcomes and promote long-term health.

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### What We Already Know about This Topic

- ❖ Smoking is common in China
- ❖ Interventions to quit smoking are particularly effective around the time of surgery, but the knowledge and attitudes of Chinese anesthesiologists' toward such interventions are unknown

### What This Article Tells Us That Is New

- ❖ In a survey of 800 Chinese anesthesiologists, a large proportion were knowledgeable about the health risks of smoking, had a strong perception of responsibilities, and were willing to participate in tobacco control

AS China has developed economically, it has completed the typical epidemiological transition of primary disease prevalence from infectious to noncommunicable diseases: in 2000, approximately 70% of disability-adjusted loss of life-years was due to noncommunicable diseases.<sup>1,2</sup> Tobacco use is now the most important behavioral risk factor in China, the world's largest tobacco grower and consumer.<sup>3</sup> Smokers comprise approximately a third of the Chinese population or 300 million people (57% men and 3% women), representing one third of the world's smokers.<sup>2</sup> Furthermore, approximately 530 million people in China are exposed to second-hand smoke.<sup>2</sup> As a result, a total of 673,000 deaths were attributable to smoking in 2005.<sup>4</sup> Because the tobacco epidemic continues to evolve,<sup>2</sup> the burden of tobacco-related diseases will continue to grow and poses tremendous challenges to the healthcare system in China (current projections estimate that the number of tobacco-related deaths will increase to 2 million annually by 2025).<sup>5,6</sup> Thus, there is an urgent need to reduce smoking prevalence, and tobacco control in China is an important part of the global tobacco control efforts.

Smoking cessation is an essential component of a comprehensive tobacco control strategy. Tobacco use is now viewed as a chronic disease, which may require several quit attempts before success is achieved.<sup>7</sup> Healthcare providers can play a key role in smoking cessation, because they frequently contact smokers in clinical practice. Brief interventions delivered

by healthcare providers increase the quit rates among smokers. Even simple advice on smoking cessation given by physicians can significantly increase quit rates.<sup>7-9</sup> Surgery, in particular, provides an excellent opportunity for clinicians to intervene. An estimated 30 to 40 million Chinese citizens undergo surgery each year,<sup>10</sup> and given the high prevalence of smoking, many of these surgical patients are smokers. There are two reasons why tobacco interventions in the perioperative period are attractive. First, smokers face the immediate consequences of smoking around the time of surgery, including an increased risk for cardiac, pulmonary, and wound-related complications.<sup>11-13</sup> Current evidence suggests that even brief perioperative abstinence can reduce risk.<sup>11</sup> Second, surgery is a “teachable moment” for smoking cessation, increasing the rate of spontaneous quitting, especially in those patients undergoing more extensive surgical procedures. According to a national Chinese survey conducted in 1996, 72% of current smokers reported no intent in quitting smoking, whereas 16% intended to quit but had taken no action; the most common reason for quitting was illness.<sup>14</sup> Thus, surgery could represent an excellent opportunity to motivate these smokers to attempt either short-term or long-term abstinence.

Currently, Chinese physicians have little involvement in tobacco control. As shown by a recent survey of physicians from six Chinese cities, less than half usually asked patients about smoking status.<sup>15</sup> Surgeons in particular were less likely to talk with patients regarding smoking compared with internists<sup>15,16</sup>; data for anesthesiologists are not available. The reasons that physicians are not involved may include a high prevalence of smoking among physicians, gaps in knowledge about health consequences of smoking, and lack of expertise in providing tobacco interventions. Surgical providers can and should make a difference in tobacco control. As perioperative physicians, anesthesiologists may play a unique role in addressing tobacco use in surgical patients. The purpose of this study was to assess the practices, attitudes, and beliefs of Chinese anesthesiologists regarding tobacco control, using a survey methodology. This information is essential for designing tobacco control measures targeting perioperative physicians in China and the patients they serve.

## Materials and Methods

This study was determined to be exempt by the Mayo Clinic Institutional Review Board (Rochester, Minnesota) and was approved by the Peking Union Medical College Institutional Review Board (Beijing, China).

### Study Population

The Chinese Association of Anesthesiologists was founded in 2005. The goal of the Association is to promote humanistic care to anesthesiologists and improve anesthesia practice. The 2009 annual meeting of the Association was held in Beijing, China, on April 10–12, 2009, with more than 1,400

attendees from 20 of the 22 provinces in China. This meeting provided an opportunity to survey Chinese anesthesiologists with diverse backgrounds within a short time.

All practicing Chinese anesthesiologists who attended the meeting were eligible to receive the questionnaire. A total of 800 copies of questionnaires were distributed at a variety of meeting venues. Several methods were used to increase the response rate of the survey, including reminder announcements at the meeting, multiple onsite drop boxes, and small gifts given to respondents.

### Questionnaire

The majority of the survey items are modified from a questionnaire previously designed to study practices and attitudes of anesthesiologists and surgeons regarding tobacco use interventions administered to clinicians in the United States<sup>17</sup> and Japan.<sup>18</sup> The questionnaires included items in three main domains.

**Demographics.** These items included information regarding practice environment, access to patients before and after surgery, and personal characteristics.

**Current Practices.** These items related to the current practices of anesthesiologists regarding smoking interventions, organized according to the “5 As” recommended by the U.S. Public Health Service Clinical Practice Guideline—ask (about tobacco use), advise (patients to quit smoking), assess (for willingness to quit), assist (in quitting), and arrange (for follow-up).<sup>7</sup>

**Attitudes and Beliefs.** These items queried the attitudes toward and beliefs regarding smoking interventions. They were categorized into questions related to (1) perceptions of risks and benefits of perioperative smoking abstinence; (2) perceptions of physician responsibility for intervention; (3) knowledge of issues associated with intervention; (4) perceptions of barriers to intervention; and (5) a survey of interest in learning more about how to intervene.

Because previous studies suggested that physicians in China had inadequate knowledge about smoking and that smoking-free policies had not been enforced,<sup>15,16</sup> several items on these issues were also included, with some of these additional items modified from the Global Health Professional Survey.<sup>19</sup>

All the items were originally constructed in English. They were translated into Chinese and then translated back into English to verify the accuracy of translation.

An initial version of the questionnaire was piloted with 10 anesthesiologists at Peking Union Medical College Hospital, and modifications were made for clarity based on their feedback.

### Data Analysis

Statistical analyses were carried out using Stata, version 10.0 (College Station, TX). Descriptive analyses of responses were performed and represent the primary focus of this report. The results were reported as numbers with percentages. Responses to items regarding current tobacco control practice

**Table 1.** Respondent Demographics

Characteristic	n (%)
Age (yr)	
21–30	129 (27.6)
31–40	201 (43.0)
41–50	95 (20.3)
51–60	40 (8.6)
61 or older	2 (0.4)
Gender	
Male	256 (54.8)
Female	211 (45.2)
Years in practice since completion of training	
5 yr or less	130 (27.8)
6–10 yr	120 (25.7)
11–20 yr	122 (26.1)
21 yr or more	95 (20.3)
Degree	
Bachelor	254 (54.4)
Master	133 (28.5)
Doctor	41 (8.8)
Other	39 (8.4)
Cigarette smoking status	
Never smoked	369 (79.0)
Former smoker	51 (10.9)
Current smoker	47 (10.1)

were compared based on smoking status. Smoking status was dichotomized into two categories (current smokers and not currently smoking). The comparisons of ordinal scales between the two groups were made with Wilcoxon-Mann-Whitney U tests. A  $P < 0.05$  was considered to be statistically significant.

## Results

Four hundred eighty-two questionnaires were collected from the 800 that were distributed, for a response rate of 60.3%.

Table 1 shows the demographics of the study sample. More than half the respondents were men, with approximately 70% younger than 40 yr. Ten percent of respondents were current smokers, 18.4% of males and 3.9% of females. Most smokers had smoked in hospital during the past year. More than 60% believed that if their hospital becomes smoke free, they would be more likely to quit (table 2).

Table 3 shows the characteristics of the respondents' clinical practices. Most respondents practiced in large (> 500 beds) teaching hospitals (most hospitals in China are government owned and affiliated with medical colleges). Approximately 90% reported some type of smoking restriction in their hospitals, but not all agreed that their hospitals' smoking policy was effectively enforced. Most respondents accurately estimated the smoking prevalence of their patients (within the range of 20 to 50%, consistent with national prevalence data<sup>2</sup>).

Regarding current practices, more than 70% respondents frequently or almost always ask about their patients' smoking status (table 4). Approximately half of the respondents fre-

**Table 2.** Characteristics of Current Smokers (n = 47)

Characteristic	n (%)
Number of cigarettes a day, median (range)	10 (1–30)
Number of years smoked, median (range)	10 (2–30)
Have you smoked cigarettes in hospital during the past year?	
Yes	44 (93.6)
No	3 (6.4)
Feelings toward their smoking	
No matter	1 (2.1)
My smoking is harmful to me	40 (85.1)
My smoking is harmful to surrounding personnel	21 (44.7)
As a healthcare provider, I should not smoke	14 (29.8)
My smoking affects my ability to help patients stop smoking	9 (19.1)
I want to stop smoking cigarettes now	
Strongly agree	11 (23.4)
Agree	17 (36.2)
Neutral	19 (40.4)
During the past year, have you ever tried to stop smoking cigarettes?	
Yes	25 (54.4)
No	21 (45.7)
Have you ever received help or advice to help you stop smoking cigarettes?	
Yes	15 (32.6)
No	31 (67.4)
If my hospital becomes smoke-free, I would be more likely to quit smoking	
Strongly agree	9 (19.6)
Agree	22 (47.8)
Neutral	14 (30.4)
Disagree	1 (2.2)

quently or almost always advised patients about the health risks of tobacco use, and approximately 60% frequently or almost always advised patients who smoked to quit. However, few respondents provided counseling or other resources to help their patients quit, and few provided follow-up services.

Practices depended on the smoking status of the respondents. In general, smokers were less likely to provide the five recommended elements of tobacco interventions (table 4). These differences were statistically significant for advising patients about the health risks of tobacco use (52 vs. 40% of nonsmokers and smokers, respectively, frequently or almost always advised) and advising patients to quit smoking (63 vs. 34% of nonsmokers and smokers, respectively). A similar tendency was present for counseling patients about how to quit, but it was not significant (20 vs. 15% of nonsmokers and smokers, respectively).

Regarding beliefs of how smoking affects health, high proportions of respondents agreed that smoking can cause lung cancer and that smoking can cause ischemic heart dis-

**Table 3.** Characteristics of Clinical Practice

Characteristic	n (%)
Practice environment	
Lower than county	11 (2.3)
County or region	82 (17.4)
City	196 (41.6)
Province	182 (38.6)
Teaching hospital	
Yes	379 (80.5)
No	92 (19.5)
No Beds	
< 100	12 (2.6)
100–500	106 (22.5)
500–1000	151 (32.1)
> 1000	202 (42.9)
What is your hospital's current policy regarding smoking?	
No restrictions	48 (10.2)
Smoking allowed only in specific spaces that are not enclosed	159 (33.8)
Smoking allowed only within enclosed specific rooms for smoking	120 (25.5)
Smoking prohibited inside of the building	53 (11.3)
Smoking prohibited anywhere on hospital grounds	84 (17.8)
Do not know	7 (1.5)
My hospital's official smoking policy is effectively enforced	
Strongly agree	92 (19.7)
Agree	219 (47.0)
Neutral	120 (25.8)
Disagree	32 (6.9)
Strongly disagree	3 (0.6)
Approximately what percentage of your patients currently smoke cigarettes?	
None	10 (2.1)
1–10%	20 (4.3)
11–20%	48 (10.3)
21–30%	100 (21.4)
31–50%	155 (33.2)
51–90%	54 (11.6)
> 90%	16 (3.4)
Do not know	64 (13.7)
What is your usual patient mix?	
Primarily inpatients	386 (82.7)
Primarily outpatients	25 (5.4)
Even mix of outpatients and inpatients	56 (12.0)
The following questions deal with your interactions with patients. How often do you:	
See patients preoperatively before the day of surgery	
Never or rarely	16 (3.4)
Sometimes (< 25% of the time)	56 (12.0)
Frequently (25–75% of the time)	112 (24.0)
Almost always (> 75% of the time)	283 (60.6)
See your hospitalized patients postoperatively	
Never or rarely	27 (5.8)
Sometimes (< 25% of the time)	134 (28.7)
Frequently (25–75% of the time)	177 (37.9)
Almost always (> 75% of the time)	129 (27.6)

ease (table 5). Almost all respondents agreed that smoking increases the risk of respiratory complications in the perioperative period, whereas few recognized that smoking increases the risk of wound complications. The benefits of abstinence were well recognized; more than 90% agreed or strongly agreed that quitting smoking for 6 months or longer before surgery will significantly reduce the rate of postoperative complications, whereas few believed that quitting smoking for 1 to 30 days has benefits. More than half the respondents felt that nicotine withdrawal is a significant problem for surgical patients.

Regarding the beliefs of physician responsibilities, most respondents agreed or strongly agreed that advising patients to quit is the anesthesiologists' responsibility (90%) and the perioperative period is a good time to get patients to quit smoking (76%; table 6). Most of them also recognized their standing as role models and that their advice could be effective. However, most respondents did not know how to counsel about smoking or help patients get the help they needed to quit (table 7). Although not in the majority of respondents, some identified several potential barriers to intervention, including producing additional stress in patients who are already stressed by surgery, doubts about the efficacy of their advice, and lack of time. Nonetheless, more than 85% of respondents were willing to spend an extra 5 min to help patients to quit smoking (table 8). Most of them were also interested in learning about effective interventions and in participating in educational programs.

## Discussion

This is the first survey of Chinese anesthesiologists regarding tobacco control and provides information to inform future efforts in tobacco control among surgical patients in China.

Clinical practice guidelines formulated by the United States Public Health Service recommend efficacious techniques for the provision of tobacco interventions by clinicians, codified as the "5 As" approach—ask, advise, assess, assist, and arrange.<sup>7</sup> A recent Chinese clinical guideline adopted these recommendations.<sup>20</sup> In this study, although the majority of the respondents reported that they always practiced "ask" and "advise," few performed further efforts. This finding is consistent with previous studies on physician-delivered smoking cessation interventions in other countries. For example, extant studies in the United States suggest that the delivery of especially the last 3 As (assess, assist, and arrange) remains low.<sup>21–28</sup> Several barriers to adoption of the 5 As approach by clinicians have been identified, including lack of time, training, and low self-efficacy,<sup>21,29,30</sup> which were also mirrored in the current results.

Given that a similar survey was recently (in 2004) conducted among anesthesiologists in the United States, comparisons in current practices can be made between Chinese and U.S. anesthesiologists.<sup>17</sup> \*\*Fewer Chinese anesthesiologists always asked about smoking history (73 vs. 96%), but the rates of advising about health risks of smoking (51 vs.

**Table 4.** Current Practices Regarding Tobacco Control (Comparisons Were Made by Wilcoxon Mann–Whitney U Test)

The Following Questions Deal with Your Interactions with Patients. How Often Do You:	Group	n	Never or Rarely, n (%)	Sometimes (< 25% of the time), n (%)	Frequently (25–75% of the time), n (%)	Almost always (> 75% of the time), n (%)	P Value
Ask your patients if they smoke cigarettes?	Total	482	30 (6.2)	102 (21.2)	142 (29.5)	208 (43.2)	0.170
	S	47	2 (4.3)	15 (31.9)	14 (29.8)	16 (34.0)	
	NS	419	27 (6.4)	84 (20.1)	124 (29.6)	184 (43.9)	
Advise your patients about the health risks of tobacco use?	Total	482	56 (11.6)	180 (37.3)	138 (28.6)	108 (22.4)	0.027
	S	47	10 (21.3)	18 (38.3)	14 (29.8)	5 (10.6)	
	NS	419	46 (11.0)	157 (37.5)	119 (28.4)	97 (23.2)	
Advise your patients who use tobacco to quit?	Total	482	44 (9.1)	149 (30.9)	142 (29.5)	147 (30.5)	0.001
	S	47	10 (21.3)	21 (44.7)	9 (19.2)	7 (14.9)	
	NS	419	33 (7.9)	123 (29.4)	130 (31.0)	133 (31.7)	
Counsel your patients who use tobacco about how to quit?	Total	482	190 (39.4)	193 (40.0)	61 (12.7)	38 (7.9)	0.096
	S	47	24 (51.1)	16 (34.0)	6 (12.8)	1 (2.1)	
	NS	419	163 (38.9)	171 (40.8)	50 (11.9)	35 (8.4)	
Provide resources to your patients who use tobacco to help them quit?	Total	481	277 (57.6)	139 (28.9)	46 (9.6)	19 (4.0)	0.609
	S	47	29 (61.7)	12 (25.5)	6 (12.8)	0 (0)	
	NS	419	243 (58.0)	120 (28.6)	38 (9.1)	18 (4.3)	
Follow-up with your patients afterward to address any difficulties with quitting?	Total	481	280 (58.2)	141 (29.3)	49 (10.2)	11 (2.3)	0.743
	S	47	30 (63.8)	9 (19.2)	7 (14.9)	1 (2.1)	
	NS	419	245 (58.5)	126 (30.1)	39 (9.3)	9 (2.2)	
Follow-up with your patients afterward to collect quitting outcome information?	Total	481	299 (62.2)	133 (27.7)	36 (7.5)	13 (2.7)	0.816
	S	47	31 (66.0)	10 (21.3)	5 (10.6)	1 (2.1)	
	NS	419	264 (63.0)	113 (27.0)	31 (7.4)	11 (2.6)	

NS = nonsmokers; S = smokers.

52%) and advising to quit (60 vs. 57%) were similar in both surveys. Chinese anesthesiologists were less likely than their U.S. counterparts to provide resources regarding smoking cessation (14 vs. 31%). However, Chinese anesthesiologists were more likely to follow-up on their patients with regard to smoking cessation (13 vs. 3% for addressing difficulties with quitting and 10 vs. 1% for collecting quitting outcomes). This may reflect differences in clinical practices, in comparison to U.S. practices, most surgical procedures in China are primarily on an inpatient basis, so that opportunities for postoperative follow-up are greater. Overall, practices of Chinese anesthesiologists compared quite favorably with their U.S. counterparts, which is impressive given that clinical tobacco control in China is still in its infancy, and there are currently few resources to support tobacco cessation.

In this sample, 10.1% of anesthesiologists reported current smoking. A survey conducted in 2004 found that 23% Chinese physicians reported current smoking<sup>15</sup>; specialties represented in this survey included internal medicine, surgery, gynecology, pediatrics, orthodontics, emergency medicine, and traditional Chinese medicine. There are no previous data on the smoking prevalence of Chinese anesthesiologists. The difference between smoking prevalence noted in the current study and the previous survey may be dependent on physician specialty or may reflect a decline in smoking prevalence among Chinese physicians in the

time between the two surveys. The latter may be supported by the observation that in our sample, the prevalence of former smoking was 10.9%, which is much higher than the 2.7% reported in the prior survey. In countries where tobacco control efforts are more advanced, smoking prevalence of smoking among physicians is very low; for example, the prevalence of smoking among U.S. anesthesiologists is approximately 1%.<sup>17</sup> In general, a decrease in smoking prevalence among physicians precedes prevalence decreases in the general population.<sup>31</sup>

The smoking behavior of physicians themselves is important, because it influences their tobacco control practices. Consistent with previous studies of physicians, nonsmoking anesthesiologists were more likely to advise patients about the health risks of smoking and advise smokers to quit.<sup>15,16,18</sup> This finding suggests that efforts to help anesthesiologists quit smoking may increase the frequency with which these physicians provide tobacco interventions. Most anesthesiologists who smoked were interested in quitting and many of them had made quit attempts in the past year. However, only a small proportion of them had received any help or advice. Also, most felt that a smoke-free hospital would help them quit. Although approximately 90% respondents reported some type of smoking restrictions in their hospital, most fell short of a completely smoke-free environment. This should be one of the targets of tobacco control in

**Table 5.** Attitudes and Beliefs: Risks and Benefits, n (%)

Question	n	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Do Not Know
Health risk of smoking							
Smoking can cause lung cancer	475	210 (44.2)	206 (43.4)	54 (11.4)	5 (1.0)		
Smoking can cause ischemic heart disease	475	199 (41.9)	230 (48.4)	41 (8.6)	4 (0.8)	1 (0.2)	
Smoking increases the risk of respiratory complications during and after surgery	475	281 (59.2)	177 (37.3)	13 (2.7)	3 (0.6)	1 (0.2)	
Smoking increases the risk of postoperative wound complications	475	178 (37.5)	215 (45.3)	69 (14.5)	10 (2.1)	3 (0.6)	
Perioperative abstinence							
In general, quitting smoking for 6 mo or longer before surgery will significantly reduce the rate of postoperative complications	475	190 (40.0)	244 (51.4)	35 (7.4)	2 (0.4)	2 (0.4)	2 (0.4)
In general, quitting smoking for 1–30 d before surgery will significantly reduce the rate of postoperative complications	475	138 (29.0)	217 (45.7)	104 (21.9)	14 (3.0)		2 (0.4)
All patients should refrain from smoking for as long as possible before and after surgery	475	182 (38.3)	239 (50.3)	42 (8.8)	9 (1.9)	3 (0.6)	
In my surgical patients who smoke cigarettes, symptoms of nicotine withdrawal during hospitalization are a significant problem for them if they do not smoke postoperatively	475	84 (17.7)	196 (41.3)	128 (27.0)	39 (8.2)	7 (1.5)	21 (4.4)

China, as smoke-free hospitals will also provide a healthier environment for patients and employees.

There are several encouraging findings from this survey that emphasize the unique position of anesthesiologists to

lead tobacco control interventions directed towards surgical patients (and others) in China.

First, Chinese anesthesiologists are quite aware of the health risks of smoking. For example, the proportion of our

**Table 6.** Attitudes and Beliefs: Responsibility, n (%)

Question	n	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Do Not Know
Health professionals serve as role models for their patients and the public	475	178 (37.5)	242 (51.0)	49 (10.3)	4 (0.8)	2 (0.4)	
A patient's chances of quitting smoking are increased if a health professional advises him or her to quit	475	103 (21.7)	282 (59.4)	79 (16.6)	11 (2.3)		
Health professionals who do not smoke are more likely to advise patients to stop smoking	475	154 (32.4)	261 (55.0)	50 (10.5)	8 (1.7)	2 (0.4)	
It is none of my business if a patient chooses to smoke	475	25 (5.3)	46 (9.7)	89 (18.7)	231 (48.6)	83 (17.5)	1 (0.2)
It is part of my responsibility as an anesthesiologist to advise my patients to quit smoking.	467	144 (30.8)	279 (59.7)	38 (8.1)	3 (0.6)	1 (0.2)	2 (0.4)
It is part of my responsibility as an anesthesiologist to make sure that patients get the help they need to quit smoking	466	71 (15.2)	258 (55.4)	123 (26.4)	7 (1.5)		7 (1.5)
The perioperative period is a good time to get patients to permanently stop smoking	466	116 (24.9)	241 (51.7)	96 (20.6)	8 (1.7)	1 (0.2)	4 (0.9)

**Table 7.** Attitudes and Beliefs: Knowledge and Perceptions of Barriers, n (%)

Question	n	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Do Not Know
Knowledge regarding interventions							
Nicotine replacement therapies such as nicotine gum or patches are safe for patients to use during surgery	466	21 (4.5)	92 (19.7)	110 (23.6)	102 (21.9)	35 (7.5)	106 (22.8)
Nicotine replacement therapies such as nicotine gum or patches are safe for patients to use after surgery	466	19 (4.1)	156 (33.5)	130 (27.9)	40 (8.6)	13 (2.8)	108 (23.2)
There are effective nonnicotine medications to help patients quit smoking	470	37 (7.9)	160 (34.0)	130 (27.7)	21 (4.5)		122 (26.0)
I do not know how to counsel my patients about how to quit smoking	466	35 (7.5)	154 (33.1)	156 (33.5)	97 (20.9)	14 (3.0)	8 (1.7)
I know how to help my patients get the help they need to quit smoking	466	28 (6.0)	160 (34.3)	170 (36.5)	39 (8.4)	7 (1.5)	62 (13.3)
Perception of barriers							
In general, efforts at any time (not just around the time of surgery) to help people quit smoking just are not very effective	466	53 (11.4)	177 (38.0)	142 (30.5)	82 (17.6)	7 (1.5)	5 (1.1)
I should not talk to patients preoperatively about smoking because they may already be nervous and upset about the surgery	465	23 (5.0)	82 (17.6)	96 (20.7)	219 (47.1)	42 (9.0)	2 (0.4)
I only see a patient for a few minutes preoperatively, and any advice I give to stop smoking would not be effective	466	28 (6.0)	104 (22.3)	145 (31.2)	160 (34.3)	23 (4.9)	4 (0.9)
I do not have time to counsel my patients about how to quit smoking	465	39 (8.4)	167 (35.9)	134 (28.8)	103 (22.2)	15 (3.2)	4 (0.9)

respondents who agreed that smoking causes ischemic heart disease (90%) compares favorably with the proportion reported in the 2004 national survey (67%)<sup>15</sup> There was also a high awareness of how smoking increases perioperative risk, perhaps because they frequently witness the detrimental effects of smoking in their daily practice because of the high prevalence of smoking in surgical patients in China. These correct perceptions of risks may motivate anesthesiologists to participate in tobacco control as a means to improve patient safety. However, there are misconceptions regarding some aspects of tobacco control (*e.g.*, doubts about the efficacy of interventions and the benefits of short-term abstinence) that should be the target of educational efforts.

Second, Chinese anesthesiologists recognize their responsibilities and are willing to engage in tobacco control efforts. For example, the perception of responsibility to make sure that patients get help in quitting is much stronger among Chinese anesthesiologists compared with their American and Japanese counterparts (71% agreed or

strongly agreed with this item, compared with 20 and 35%, respectively, in the prior surveys<sup>17,18</sup>). They also have a strong interest in learning about ways to help patients quit, including participation in educational programs and other training opportunities.

Third, the characteristics of anesthesia practice in China provide considerable opportunities for perioperative smoking cessation intervention. Because these anesthesiologists provide care primarily in an inpatient setting (there is very little ambulatory surgery in current Chinese practice), there are more opportunities to intervene compared with practice in the United States, where the majority of patients are outpatients. Approximately 85% of the respondents routinely see patients preoperatively and 65% see patients postoperatively in hospital, providing opportunities to provide reinforcing messages on smoking cessation. This may also explain why a lower proportion of respondents agreed that they do not have time to do smoking counseling compared with U.S. practice (45 *vs.* 67%, respectively<sup>17</sup>) and why more

**Table 8.** Interest in Learning about Interventions, n (%)

Question	n	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Do Not Know
If I could effectively intervene, I would be willing to spend an extra 5 min preoperatively helping a patient who smokes to quit	471	107 (22.7)	297 (63.1)	58 (12.3)	6 (1.3)		3 (0.6)
I would refer a patient who smokes to an effective intervention service available in my practice setting if it did not require extra time on my part	471	64 (13.6)	276 (58.6)	102 (21.7)	14 (3.0)	2 (0.4)	13 (2.8)
I would be interested in learning more about how to help my patients quit smoking	471	71 (15.1)	250 (53.1)	128 (27.2)	9 (1.9)		13 (2.8)
I would attend a workshop on tobacco intervention held as part of a national anesthesiology/surgical meeting	471	81 (17.2)	280 (59.5)	94 (20.0)	5 (1.1)		11 (2.3)
I would attend a workshop on tobacco intervention if offered locally	471	68 (14.4)	269 (57.1)	108 (22.9)	8 (1.7)		18 (3.8)

indicated willingness to spend extra time to provide interventions (85 vs. 64%).

Finally, the practices and attitudes of Chinese anesthesiologists toward tobacco control are considerably more favorable than their surgical colleagues, as assessed by a recent national survey of Chinese male surgeons<sup>16</sup> Although direct comparisons are difficult because only men were surveyed, smoking prevalence was 45% among male surgeons (compared with 18% for male anesthesiologists in our survey), and the rate at which the intervention elements of “ask” and “advise” were delivered was much less in these surgeons. Anesthesiologists may thus be in a good position to lead perioperative tobacco control, incorporating the efforts of all members of the surgical team.

This study has several potential limitations. The primary limitation is whether this sample is representative of Chinese anesthesiologists. No data are available to describe the practice characteristics of Chinese anesthesiologists, and a national roster of anesthesiologists that could be used to sample this population (as was done in our prior studies<sup>17,18</sup>) is not available. As a feasible alternative, we sampled attendees of a national anesthesiologists’ meeting that represented primarily practices in large urban centers. Although these attendees were from throughout China, this population may not be representative of the general population of Chinese anesthesiologists. For example, anesthesiologists serving rural population may be underrepresented. Also, most respondents practiced in large teaching hospitals, which likely reflects the fact that most hospitals in China are government owned and affiliated with medical colleges. In addition, although the

response rate was quite favorable in comparison with recent physician surveys,<sup>17,32</sup> it is possible that responses were biased toward those with more interest in tobacco control. Finally, this survey methodology relies on self-report of behavior, which may not reflect actual behavior.

In summary, this study provides important information on Chinese anesthesiologists’ practice, knowledge, and attitudes regarding tobacco control. The results suggest that anesthesiologists can play a significant role in tobacco control in China. Educational programs should be implemented to address gaps in knowledge and to change attitudes. More importantly, interventions should be designed for surgical patients in China, as successful innovations could both improve perioperative outcomes and promote long-term health of the large population of Chinese smokers.

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