Translating preoperative smoking cessation interventions into routine clinical care of veterans: provider beliefs

Catherine C Vick, MS,¹ Laura A Graham, MPH,¹ William G Henderson, PhD,²
Thomas K Houston, II MD MPH,^{3,4} Mary T Hawn, MD, MPH^{1,5}

¹Center for Surgical, Medical Acute Care Research and Transitions, Birmingham VAMC, Birmingham, AL, USA

²Health Outcomes Program, University of Colorado, Aurora, CO, USA

³VA eHealth Quality Enhancement Research Initiative, Bedford VAMC, Bedford, MA, USA

⁴Division of Health Informatics and Implementation Science, Quantitative Health Sciences and Medicine, University of Massachusetts Medical School, Worcester, MA, USA

⁵Section of Gastrointestinal Surgery, Department of Surgery, University of Alabama, Birmingham, School of Medicine, Birmingham, AL, USA

Correspondence to: C C Vick
catherine.vick@va.gov;

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ABSTRACT

Smoking among veterans undergoing surgery is estimated to be 36%. Smoking has been linked to postoperative surgical complications including ischemia and cardiac arrhythmias, pneumonia, deep venous thrombosis, pulmonary embolism, and surgical site infection.

Preoperative smoking cessation interventions, in which smokers quit at least 6 weeks prior to surgery, have been shown to be effective both in smoking cessation and reduction of postoperative complications; however, little is known about physician beliefs regarding the optimal location and the responsible provider for intervention, or whether surgery should be postponed or delayed based on smoking status. Within the routine coordination from medical to surgical care, how should cessation interventions best be implemented? To better inform the translation of preoperative best practices for smoking cessation into clinical care in VA, a survey regarding preoperative smoking cessation beliefs and practices was administered to primary care physicians, surgeons, and anesthesia providers. Chi-square tests were used to examine differences in proportions by provider type. Most providers agreed that the primary care clinic is the best location for intervention, with preoperative and surgical clinics ranked by few as the optimal location (13% and 11%, respectively); most respondents (82%) reported that they would refuse or delay surgery in some cases based on smoking status. There were no differences in either beliefs on location or delay based on provider type. Primary care providers were most likely to advise (86.7%) and assess (80.0%) while anesthesia providers were least likely (59.1% and 22.7%, respectively). Taking time to counsel and the belief that dedicated resources would improve quit rates were associated with advising patients to quit smoking, while being uncomfortable with counseling, the belief that acute health takes precedence and the belief that there is not always time to counsel were identified as barriers to assessing patients for smoking cessation intervention. Primary care providers were more optimistic (100%) that patients would quit if counseled, more often (73.3%) reported having time to counsel, and were less likely to report that acute health takes precedence. Most providers believe that smoking cessation would reduce postoperative complications, with the ideal location for the intervention being the primary care clinic, and that some surgical cases should be delayed for this intervention.

Implications

Researchers: Implementing preoperative smoking interventions requires input from multiple stakeholders.

Practitioners: Preoperative smoking cessation interventions are difficult to implement and likely need to be integrated into primary care and preoperative clinic.

Policy makers: In the VA healthcare system, preoperative smoking cessation implementation should occur starting in the primary care office, and before and during the surgical consultation process.

All authors contributed equally to this work.

KEYWORDS

Smoking cessation, Counseling, Preoperative, Advise, Assess, Postoperative surgical complications, Primary care clinic, Anesthesia, Smoking status

BACKGROUND

Smoking is one of the most preventable causes of death in the USA, accounting for one in five deaths annually [1, 2]. Despite this, it is estimated that nearly 21% of US adults are current smokers. The rate of smoking is estimated to be higher among veterans (27%) and even higher still among those veterans who utilize VA for healthcare (30%) [3]. Among veterans undergoing surgery every year, smoking prevalence is estimated to be 36%; with an average of 375,000 surgical procedures within the VA system annually, approximately 135,000 of these patients are smokers [3].

The frequency and costs of smoking-related postoperative complications is significant. Prior studies have found an independent association between smoking and postoperative complications, including cardiovascular complications, pneumonia, pulmonary embolism, and surgical site infection [4–

8]. Preoperative smoking cessation interventions, when patients quit at least 6 weeks prior to surgery, have been shown to be effective at increasing the likelihood that smokers will quit as well as reducing postoperative outcomes [8–13]. Implementation of smoking cessation interventions in the preoperative period is challenging. Little is known about the optimal location for preoperative smoking cessation, especially in regard to physician knowledge, attitudes, and beliefs about smoking cessation interventions across specialties. In our clinical setting, Veterans' Affairs hospitals, implementation of consistent preoperative cessation intervention might require considerable re-engineering of preoperative care. Within the routine coordination from medical to surgical care, how should cessation interventions best be implemented?

In order to better examine the best location and specialty for implementation of preoperative smoking cessation interventions in VA, more information on provider adherence to the recommended “5 A's” (ask, advise, assess, assist, and arrange) guidelines, as well as specific information on barriers and facilitators is needed. We examined healthcare provider beliefs about the optimal location for preoperative smoking cessation intervention, knowledge, attitudes, and beliefs on delay and refusal of elective surgery based on smoking status, as well as practice patterns in regard to smoking cessation intervention.

METHODS

This study was a cross-sectional survey of healthcare providers involved in preoperative and primary care. The study was conducted in accordance with the Declaration of Helsinki and approved by the Birmingham VAMC Institutional Review Board (study 1261) under a waiver of informed consent.

Study population—To understand the perspectives of VA preoperative providers, we recruited surgeons and anesthesia providers, including both anesthesiologists and nurse anesthetists. We worked with VA program staff (leaders in surgery and anesthesiology) to implement the surveys. Self-administered surveys consisting of 6 questions and 49 elements were distributed to surgeons at the national Association of VA Surgeons meeting. The surveys were administered to anesthesia providers within the VA system via an email link. Provider affiliation and specialty were collected. In addition, we sought to compare the opinions of these providers with primary care providers and recruited a sample of internal medicine physicians attending the national Society of General Internal Medicine meeting. It was expected that surveys would take no longer than 30 min for participants to complete. All surveys were collected in 2009.

Variables—The primary variable of interest was the setting in which healthcare providers thought that preoperative smoking cessation should take place.

Additional measures included: whether providers would delay surgery in some cases based on smoking status, whether providers would refuse surgery in some or all cases based on smoking status, and whether providers thought that preoperative smoking cessation was important. Also, self-reported physician practice patterns in regard to assessing smoking status and advising smoking cessation were collected. Data from questionnaires were double-entered into Access databases and checked for quality control purposes. Any discrepancies were addressed by group review.

Data analysis—Univariate statistics including frequencies and percentages were calculated to describe the study sample, as well as responses provided. Chi-square tests were used to compare proportions between groups of providers. All data analyses were conducted using SAS software version 9.1.3 [14].

RESULTS

There were 92 questionnaires available for analysis. Of the respondents 55 (60%) were surgeons, 22 (24%) were anesthesia providers, and 15 (16%) were primary care providers. Only seven respondents identified themselves as CRNAs. Due to the small sample size of CRNAs, they were accounted for in the “anesthesia provider” category in analyses. Fifty-nine (64%) respondents identified themselves as at least part-time VA providers.

While the majority of providers agreed that the primary care clinic is the best location for intervention, the preoperative clinic and surgical clinics were ranked by some providers as an optimal location for intervention (13% and 11%, respectively) (Fig. 1). The majority of surgeons (76.4%), anesthesia providers (96.0%), and primary care providers (60.0%) consistently agreed that the primary care clinic was the preferred location for preoperative smoking cessation intervention ($p > 0.1$, nonsignificant for all comparisons).

Most respondents reported that they would either delay or refuse elective surgery in some cases based on smoking status ($N = 74$, 82%), with 40% of providers reporting that they would delay surgery based on smoking status in some cases, while 57% of providers reported that elective surgery should be refused in some cases. Only 2% of respondents reported that elective surgery should be refused in all cases based on smoking status. When examined by provider type, there were no significant differences in opinion on whether to delay or refuse surgery (Table 1). There were no differences based on VA affiliation.

When examining provider practice habits, overall, 77% of providers reported that they *always/usually* advise smoking patients to quit with only 48% *always/usually* assess a smoking patient's readiness to quit. There was no significant difference between

Fig. 1 | Provider adherence to guidelines by provider type

providers when comparing the percent that always/usually advise their smoking patients to quit ($p=0.2$); however, there were significant differences between providers when comparing the percent that always/usually assess their smoking patients willingness to quit ($p=0.02$) (Fig. 1). Primary care providers were most likely to always/usually advise (86.7%) and assess (80.0%) while anesthesia providers were least likely (59.1% and 22.7%, respectively). There were no differences based on VA affiliation.

Taking time to counsel ($p<0.0001$) and believing that quit rates would improve with dedicated resources were significantly associated with advising smoking patients to quit ($p=0.02$), with 64.8% of those who always advise reporting that they take time to counsel vs. 14.3% of those who rarely advise and 52.1% of those who always advise reporting a belief that quit rates would improve with dedicated resources vs. 0.0% of those who rarely advise. Being uncomfortable with counseling ($p=0.01$), the belief that a patient's acute health takes precedence ($p=0.03$) and believing that they do not have time to counsel ($p=0.04$) were identified as the biggest barriers to a provider assessing a smoking patient's willingness to quit. Of those who rarely assess patients, 28.6% reported that they were uncomfortable with counseling, 77.8% reported that acute health takes precedence, and 85.7% reported they do not have time to counsel, while of those who always assess, 15.9% were uncomfortable with counseling, 45.5% agreed that acute health takes precedence, and 59.1% agreed that they do not always have time to counsel.

When examined by provider type, there was a significant difference in the belief that counseling was effective ($p=0.02$). Primary care providers were more optimistic with 100% agreeing that smokers were more likely to quit when counseled, but this differed significantly from anesthesiologists and surgeons (68.2% and 74.6%, respectively). Primary care providers were also more likely to report that they had time to counsel as compared to anesthesia providers and surgeons (73.3% vs. 40.9% and 49.1%, respectively, $p=0.03$) and less likely to report that acute health takes precedence (26.7% vs. 72.7% and 59.3%, respectively, $p=0.02$). Differences were not found between VA and non-VA providers.

DISCUSSION

The translation of best practices for preoperative smoking cessation into the routine flow of clinical care in VA requires pre-implementation research to identify barriers, facilitators, and actionable factors to target. This is the first study to examine in detail surgical and non-surgical provider preferences on location of preoperative smoking cessation intervention in conjunction with knowledge, attitudes, and beliefs regarding the delay or refusal of surgery to accomplish the intervention. We found that the majority of providers rank the primary care clinic as the preferred location for preoperative smoking cessation, with no significant differences by provider type. Primary care providers also appear to be best informed on methods and effectiveness of counseling.

Table 1 | Opinions on delaying or refusing surgery by provider type

	Overall <i>N</i> (%)	Surgeons <i>N</i> (%)	Anesthesia providers <i>N</i> (%)	Primary care providers <i>N</i> (%)	<i>p</i> value
Delay surgery in some cases	36 (40.0)	25 (46.3)	7 (33.3)	4 (26.7)	0.17
Refuse surgery in some cases	52 (56.5)	35 (63.6)	10 (45.5)	7 (46.7)	0.30
Refuse surgery in all cases	2 (2.2)	2 (3.6)	0 (0.0)	0 (0.0)	0.27

As seen in previous studies, we found marked variation in adherence to guidelines by provider type [15–17]. The majority of previous research has focused on primary care providers with very few studies examining perspectives of surgeons and anesthesiologists as would be necessary to fully assess perspectives of the preoperative care team. Primary care providers are often the first member of the preoperative care team as they have established care with the patient and often make the referral for surgery. However, surgeons and anesthesiologists also have opportunities to counsel, and there is evidence that counseling provided by multi-provider teams has an effect on smoking quit rates [17].

A significant challenge in implementing preoperative smoking cessation is timing. Most successful cessation trials have initiated cessation 6 weeks prior to surgery. Six weeks is not the usual time period for a preoperative clinic visit. Again, due to this timing, preoperative cessation likely remains within the primary care domain.

Interestingly, we found that nearly three quarters of providers surveyed would delay or refuse surgery based on smoking status in at least some cases, with no significant differences based on provider specialty. Delaying surgery, for some elective cases, may be possible. This suggests an interesting target for interventions, linking timing of surgery to cessation efforts. Previous editorial commentaries have called for delays in elective surgery for smokers to give smokers a chance to quit [18]. Creating a delay for some highly elective surgery may enhance patient awareness that quitting is critical, creating a teachable moment.

Teachable moments have been defined as events that can change behavior. Previous studies have found that surgery, especially major surgery, is a teachable moment for smoking cessation. Shi et al. found the incidence rate ratio for smoking cessation in those undergoing major surgery was 2.02 (95% CI 1.67–2.44) [11]. Villebro et al. found that those patients who receive preoperative smoking cessation intervention have higher quit rates at 1 year than those not receiving intervention [19]. While smoking cessation prior to surgery reduces surgical complications, the benefits of preoperative cessation have more far reaching effects, including improved lung function [20] and increased life expectancy [21]. While our findings that most practitioners ask and advise patients about smoking are in line with other studies, including national surveys of health professionals smoking cessation beliefs and practices [22–24], there is variation in the literature regarding whether physicians believe that smoking cessation counseling is effective, with estimates ranging from less than 33% to 62% [24, 25]. This variation in beliefs regarding the effectiveness of smoking cessation counseling may be related to why not all physicians in our study feel that surgery should be delayed. Additionally, in the case of urgent procedures, the benefits of the procedure may outweigh

the benefits of smoking cessation, leading physicians to not delay surgery.

When looking at barriers to cessation intervention by provider type, we found a significant difference in attitudes. Primary care providers were significantly more likely to agree that they take time to counsel at each visit, despite many believing they do not have time to counsel. Primary care providers were also more likely to agree that patients were more likely to quit when counseled. This, in addition to our findings that the majority of providers ranked the primary care clinic as their most preferable location for an intervention and that primary care providers are best informed on methods and effectiveness of counseling, clearly points to the primary care clinic as the ideal location for a preoperative smoking cessation intervention, as has been suggested in previous studies [26]. However, approximately 50% of providers, regardless of type or affiliation, agreed that quit rates would improve with more resources from the facility. The next steps would be assessing the need for resources within the primary care clinic, assessing how referrals to surgery could be re-engineered to include pre-referral smoking cessation, and assessing potential delays in elective surgery for cessation attempts.

This study has several limitations, including our convenience sample of providers. Despite the relatively small sample size, we identified important convergence of opinion on several questions. Our survey was administered to surgeons and primary care providers at national meetings, while it was administered to anesthesiologists within the VA system via email. Thus, our results may not be representative of all health care providers. Additionally, the anesthesia survey was limited to VA practitioners, while the surgery and primary care groups included both VA and non-VA practitioners (although the majority was VA providers). Also, we did not survey nurses, nurse practitioners, clinical pharmacists, and other non-physician providers in the primary care and surgical settings who all play a potential role in encouraging veterans to quit smoking. Future work should also include patient perspectives on delaying surgery for smoking cessation, as well as a more detailed examination of the continuing education and resources needed by individual specialties and examination of how smoking cessation counseling is best delivered within team-based models.

CONCLUSIONS

This pilot study of knowledge, attitudes, and beliefs suggests that most providers, regardless of specialty, believe that smoking cessation would be an effective strategy to reduce postoperative complications, that the ideal location for this intervention is the primary care clinic, and that some cases could be delayed for this intervention. Further studies on which patient/procedure populations are most amenable to preop-

erative smoking cessation counseling, the education and resources needed by individual specialties to best deliver such counseling, and how this counseling is best delivered in a team-based model are needed.

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