

The Impact of Smoking on Surgical Outcomes

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Smoking substantially increases a patient's risk of surgical complications. Despite this, almost half of all surgeons do not routinely counsel their patients to stop smoking before an operation. Studies show that although up to 75% of smokers who undergo surgery would like to quit, only about 5% will stop smoking permanently around the time of elective surgery. The intent of this article is to raise surgeon awareness of the deleterious impact of smoking on surgical outcomes and emphasize the unique opportunity in the teachable moment of surgery to enable patients to succeed in their efforts to quit smoking.

Toll of smoking on surgical care and need for action

Smoking is the leading preventable cause of morbidity and mortality in the United States. It is associated with a number of chronic conditions, including cancer, coronary artery disease, chronic obstructive pulmonary disease, cerebrovascular disease, and peripheral vascular disease. Despite major advances in tobacco control in the 20th century, 44 million Americans continue to smoke and 1 in 5 deaths in the United States can be attributed to tobacco use.¹ Each year, smoking causes nearly 440,000 deaths in the United States, which by comparison, is more than HIV, illegal drug use, alcohol use, motor vehicle accidents, and suicides combined.² It is estimated that the societal costs of tobacco use amount to \$96 billion in medical expenses and \$97 billion in lost productivity annually.² In addition to the tremendous toll on the health of the American people, smoking places a considerable burden on an already strained US health care system, diminishing our ability to contain costs, expand access, and improve quality.

Smoking has long been identified as a risk factor for chronic disease, but a growing body of evidence suggests that it is also an independent risk factor for surgery. Because this association was first described in 1944,³ more than 300 studies have examined the association

between smoking and surgical outcomes.⁴ Active smoking is clearly linked to an increased risk of perioperative cardiovascular, pulmonary, and wound healing complications, including infections, anastomotic dehiscence, reintubation, and respiratory failure. These complications in turn result in longer hospital stays, higher rates of ICU admission, greater need for repeat surgery, and higher overall costs of care. Smoking at the time of surgery is also associated with inferior long-term surgical outcomes and decreased overall patient satisfaction with the procedure.

Importantly, even brief preoperative smoking cessation can substantially reduce the risk of complications, and there are a number of effective interventions to help patients stop smoking. Studies show that 75% of patients would like to quit smoking,⁵ and that scheduling of elective surgery provides a unique opportunity to help smokers quit in the long term.⁶ However, we are currently not doing enough to seize this teachable moment. Patients are often poorly informed of the benefits of smoking cessation for surgical outcomes^{7,8} and unaware of available resources for quitting.⁹

In addition to the adverse health consequences, a substantial financial cost is associated with these surgical complications. One study estimates that the pulmonary complications associated with perioperative smoking result in an additional cost of \$52,000 per surgical episode.¹⁰ At a time when our nation is struggling to curb health costs and maintain quality of care, increased emphasis on perioperative smoking cessation holds great promise. As first-hand witnesses of the enormous burden of tobacco use, frontline clinicians should take a proactive stand to reduce the health care costs associated with active smoking. A key next step in smoking cessation efforts is to involve surgeons to a greater degree in perioperative cessation activities. Given the power of the teachable moment and the long-term health benefits to patients, surgeons should seize any opportunity to help their patients quit smoking, without fearing that brief preoperative abstinence could worsen outcomes. Specifically, surgeons should identify patients who smoke, provide access to intensive smoking-cessation interventions, and insist on complete abstinence before operating, particularly for nonessential, elective procedures. The goal of this article is to highlight the existing scientific data about the impact of smoking on surgical outcomes, and to suggest ways that surgeons in particular can lead the efforts nation-

Disclosure Information: Nothing to disclose.

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ally to use an operation as a key opportunity to advance smoking-cessation efforts.

Basic science: how smoking increases perioperative complications

Most tobacco products are made from the species *Nicotiana tabacum*, which contains approximately 4,000 chemical compounds, at least 55 of which are carcinogenic.^{11,12} Cigarette smoke has a number of toxic effects, including impaired immune function, free radical release, cellular damage, and thrombogenesis. The increased risk that smoking poses for surgical patients is likely related to both the long-term consequences of tobacco use (eg, chronic obstructive pulmonary disease, coronary artery disease, etc) and the acute toxic effects of recent smoke exposure.

Vasoconstriction, thrombogenesis, and wound healing

Many cellular functions are altered by the presence of tobacco toxins with the overall pathophysiologic effect being tissue hypoxia and delayed wound healing. Cigarette smoke directly damages the microvasculature via injury and detachment of endothelial cells from the lumen of small vessels. Loss of this endothelial protection results in increased platelet activation, as well as decreased anticoagulation and antispasmodic activity secondary to diminished levels of endothelial-derived relaxing factor.¹³

Tissue hypoxia is further exacerbated by nicotine and carbon monoxide. Nicotine, the main addictive agent in cigarettes, is absorbed in seconds throughout the body. It is thought to induce vasoconstriction and thrombogenesis by stimulating catecholamine release from the adrenal medulla,¹⁴ enhancing the activity of thromboxane A₂,¹⁵ and interfering with production of prostaglandin I₂—a potent vasodilator and inhibitor of platelet aggregation.¹⁶

Carbon monoxide, another toxic byproduct of tobacco, competitively binds to hemoglobin and decreases the oxygen-carrying capacity of blood. This hypoxic state stimulates erythropoiesis and red cell aggregation, ultimately resulting in increased blood viscosity and thrombogenicity.¹⁷ Tobacco use can also stimulate a stress response mediated by enhanced fibroblast activity resulting in decreased cell migration and increased cell adhesion. The net consequence is inappropriate connective tissue deposition at the surgical site and delayed wound healing.¹⁸

Cardiopulmonary effects

The acute and chronic effects of smoking predispose surgical patients to postoperative pneumonia and respiratory failure. Although some pulmonary complications result from chronic smoking-related respiratory pathology, even smokers without signs and symptoms of chronic disease are

at increased perioperative risk.¹⁹ There are many potential mechanisms for this increased risk. Smoking stimulates goblet cell hyperplasia and impairs ciliary function, resulting in increased mucus retention.²⁰ Smoking also alters the lung's immune response; increased airway inflammation results in greater bronchial reactivity,²¹ and impaired alveolar macrophage function contributes to higher rates of postoperative infection.²² In a recent study, mice infected with *Pseudomonas aeruginosa* and exposed to tobacco smoke demonstrated delayed bacterial clearance and increased bacterial load as compared with controls.²³ Smoking appears to substantially impair the host antibacterial immune response, creating an environment ripe for infection. Over time, the toxins in tobacco smoke produce an inflammatory response that leads to the alveolar destruction and decreased lung function.

As with pulmonary complications, the adverse perioperative cardiovascular effects of smoking are thought to have both chronic and acute contributions. Smoking is a known cardiometabolic risk factor. It promotes atherosclerosis and alters lipid metabolism via increased lipolysis, insulin resistance, and tissue lipotoxicity.²⁴ But even short-term exposure poses a considerable perioperative risk through increased coagulability, increased sympathetic tone, and reduced oxygen-carrying capacity.¹⁹

The evidence: smoking increases the risk of surgical complications

Smoking has long been thought to increase the risk of perioperative complications and, with few exceptions, a preponderance of recent evidence confirms this association.²⁵ Studies across surgical specialties suggest that smoking in the perioperative period increases the risk of cardiovascular, pulmonary, and wound and bone healing complications (Table 1). It is, however, important to note that most of these data are retrospective and observational; there are relatively few randomized controlled trials assessing this association.²⁶ In addition, some studies were equivocal and unable to establish smoking as an independent risk factor for surgery.²⁷⁻²⁹ Despite these limitations and exceptions, the majority of studies indicate that patients should be advised to stop smoking before surgery to minimize the risk of complications and maximize long-term benefits of treatment. This section reviews the recent literature and highlights major studies that explore the link between smoking and surgical outcomes.

Large cross-specialty studies

The link between smoking and perioperative complications has been documented across surgical specialties. A recent systematic review of 12 cohort studies by Theadom and colleagues²⁶ found that patients who continued to

Table 1. Major Smoking-Related Perioperative Morbidities by Specialty

Specialty	Complications
General surgery	Superficial and deep wound infections, sepsis, anastomotic leak, myocardial infarction, pneumonia, prolonged intubation, stroke
Cardiac	Pulmonary complications, sternal wound infection, vein graft failure, prolonged ventilator support, ICU readmission
Plastic	Increased scarring and asymmetry, delayed wound healing, reduced skin flap survival, implant loss (breast reconstruction), lower rates of successful digital replantation (microsurgery)
Orthopaedic	Pneumonia, surgical site infections, impaired bone healing, increased postoperative pain, stroke
Pediatrics (parent smoking)	Anesthesia-related respiratory complications

smoke before surgery experienced more complications than nonsmokers, and also that short-term perioperative smoking cessation can reduce the risk of these complications. In a large retrospective cohort study reviewing the American College of Surgeons National Surgical Quality Improvement Program, Turan and colleagues³⁰ propensity matched 82,304 current smokers with 82,304 never-smoker controls. They found that smokers experienced an increase in a wide range of adverse events after surgery, including higher rates of cardiac arrest, myocardial infarction, stroke, superficial and deep wound infections, sepsis, and shock. They also found that smokers were at increased risk for pneumonia, unplanned intubation, and mechanical ventilation. Overall, smokers were 1.38 times more likely to die after surgery than nonsmokers.

Many of these findings were confirmed by Hawn and colleagues²⁷ in a recent analysis of 393,794 patients in the Veterans Affairs Surgical Quality Improvement Program database. They found that, despite being younger, current smokers had increased rates of major respiratory complications and surgical site infections as compared with former smokers and never-smokers. In addition, they noted that these findings were present across all case complexity categories, operative time, and surgical specialties.

Cardiac surgery

Given that smoking is a well-known risk factor for cardiovascular disease, there has been much discussion in other countries about whether smokers should be required to

quit before undergoing cardiac surgery.^{28,30-32} Jones and colleagues recently found that current smokers had increased rates of infection, pulmonary complications, ICU readmission, and inpatient mortality after cardiac surgery, and that these effects were most pronounced in the elderly.²⁸ After coronary artery bypass graft surgery, smokers also require prolonged ventilator support and have higher rates of sternal wound infections and vein graft failure.³¹ Vein graft failure is the chief indication for reoperation, which has major health and economic consequences: it is associated with twice the mortality, twice the cost, and a 50% decrease in postoperative rehabilitation status as compared with the initial procedure.^{29,32,33}

Smoking also has negative implications for percutaneous coronary revascularization—a less invasive and less costly alternative to coronary artery bypass graft surgery. Hasdai and colleagues found that after revascularization, smokers have increased rates of myocardial infarction and death, and that smoking cessation before or after the procedure can have beneficial long-term effects.³⁴ Another study found that quality of life scores 6 months and 1 year after revascularization were 25% to 75% lower for smokers than for nonsmokers.³⁵ Importantly, patients who quit at the time of the procedure have quality of life scores almost identical to nonsmokers, which supports the hypothesis that it is the act of smoking and not associated conditions that worsens postoperative recovery.

Plastic surgery

Plastic surgery is a specialty in which smoking cessation efforts are of paramount importance and can have particularly profound implications, given that many procedures are elective and success is judged largely on aesthetic appearance. As such, plastic surgeons should take steps to minimize factors that might increase scarring, promote asymmetry, delay wound healing, or require reoperation. Studies have found that although they prefer to operate on nonsmokers, plastic surgeons contend with a large population of smokers and routinely perform more conservative procedures on their smoking patients to minimize risk.³⁶

Smokers suffer poorer outcomes in nearly every realm of plastic surgery, with increased wound infections, reduced skin flap survival, and lower rates of successful digital replantation.¹³ Numerous trials have found that smokers are at increased risk of skin sloughs after facelift surgery, and the authors of one study attributed 74% of total skin sloughs to tobacco use.^{17,37} Even surgeons who did not themselves find an increase in skin sloughs often choose to perform more conservative procedures on smokers based on anecdotal evidence and existing data.³⁸ Surgeons performing breast reconstructions report similar findings, noting that smokers have a higher incidence of skin flap

necrosis, implant loss, skin loss, and hernia after reconstructive surgery.³⁹⁻⁴¹

Hand and foot surgeons performing microsurgery report poorer outcomes for smokers as well, likely due to reduced blood flow secondary to nicotine exposure. Studies suggest that smoking even one cigarette before a procedure can result in a 24% to 42% reduction in blood flow to the hand, lasting up to 1 hour.^{42,43}

Orthopaedic surgery

As with plastic surgery, the relatively elective nature of many orthopaedic procedures provides a valuable window to initiate smoking-cessation efforts, and evidence suggests that orthopaedic surgeons have good reason to do so. In a recent retrospective analysis of 33,336 patients at Veterans Affairs facilities, Singh and colleagues⁴⁴ found that smokers undergoing total knee replacements or total hip replacements had higher rates of pneumonia, surgical site infections, stroke, and mortality than never-smokers. Another study suggested that failing to quit smoking before orthopaedic surgery was tantamount to omitting antibiotic prophylaxis.⁴⁵

Smoking also has negative implications for spinal decompressive surgery, and smoking cessation is associated with improved healing of spinal fusion. One study found that 2 years after lumbar decompressive surgery, nonsmokers reported less back and leg pain, higher quality of life, and lower consumption of analgesics as compared with smokers.⁴⁶ Similarly, in patients undergoing anterior cervical decompression surgery, smoking was found to be the single most important factor for postoperative arm pain.⁴⁷

Pediatric surgery and parental smoking

Recent evidence suggests that children exposed to second-hand smoke are at greater risk for perioperative complications. Several studies have reported a relationship between a child's level of tobacco smoke exposure and his or her risk of respiratory complications during and after anesthesia.⁴⁸⁻⁵¹ Given that approximately 1 in 7 children undergoing surgery in the United States are chronically exposed to second-hand smoke, this presents a considerable public health issue and a potentially valuable opportunity to intervene.⁵² Parents of children undergoing surgery are more likely to attempt to quit smoking but not necessarily more likely to succeed.⁵² A child's surgery provides another teachable moment and surgeons should make a concerted effort to provide the necessary support to help parents maintain smoking abstinence.

Smoking cessation and the teachable moment

A teachable moment is an event such as disease diagnosis, hospitalization, or pregnancy that motivates a patient to

change a risky health behavior. Patients might be more amenable to interventions under these circumstances because they are particularly concerned about their health. Strong evidence suggests that patients are considerably more likely to quit smoking after hospitalization. This effect is especially pronounced if the hospitalization was due to a smoking-related illness, with 1-year tobacco abstinence rates approaching 50%.^{53,54}

The scheduling of elective surgery presents a unique and powerful opportunity to encourage smoking cessation. By exploiting the potential of surgery as a teachable moment, surgeons can reduce the risk of smoking-related complications in the perioperative period and place their patients on a path to enjoying the life-long benefits of tobacco abstinence.

Current barriers

Every year, approximately 10 million smokers undergo surgery in the United States.⁵⁵ Despite the potential that surgery presents for smoking cessation, surgeons are currently not capitalizing on this teachable moment. Studies suggest that up to 25% of patients undergoing surgery continue to smoke during the perioperative period^{56,57} and that almost half of all surgeons do not routinely counsel their patients to stop smoking before an operation.⁵⁸ When advice is given, it appears to vary considerably among surgeons, and some studies suggest that both patients and physicians have concerns that perioperative cessation might actually be harmful.^{59,60} As such, many patients are not referred to appropriate smoking-cessation services and are poorly informed of the potential benefits even temporary tobacco abstinence can have for surgical outcomes.^{9,24}

The good news is that patients undergoing an operation hold surgeons in particularly high regard, presenting a valuable opportunity for surgeons to introduce a quit attempt. Studies show that even very brief (<3 minutes) counseling can increase rates of smoking cessation.⁶¹⁻⁶⁴ A more systematic and unified approach by surgeons might result in greater perioperative smoking abstinence and superior surgical outcomes.

Evidence of smoking cessation on surgical outcomes

Smoking cessation reduces perioperative complications and improves long-term outcomes (Table 2), but the exact duration of abstinence required for these benefits remains unclear and likely depends on the outcomes measured.^{6,65} Given the relatively short half-lives of nicotine and carbon monoxide, there is good reason to believe that even very brief abstinence (ie, hours to days) can be beneficial, particularly for cardiovascular complications.^{63,66} However, studies suggest that weeks or months of cessation might be necessary to reduce the risk of pulmonary complications.²⁵

Table 2. The Effect of Smoking Cessation on Surgical Outcomes

First author	Specialty	Patients, n	Length of cessation, wk	Results
Kuri ⁶⁸	Head and neck	180	>3	Lower rates of impaired wound healing
Chan ⁶⁹	Mammoplasty	173	>4	Lower rates of wound healing complications
Moller ⁶⁴	Hip and knee replacement	108 RCT	6–8	Lower rates of wound-related and cardiovascular complications, reduced hospital stay, and less secondary surgery
Lindstrom ⁶⁷	General and orthopaedic surgery	102 RCT	<4	Reduced overall complication rate

RCT, randomized controlled trial.

Most trials have found that 4 to 8 weeks of smoking abstinence substantially reduces perioperative complications and the need for repeat surgery.^{64,67} Some studies suggest that an even shorter duration of abstinence is effective. For example, Kuri and colleagues found that just 3 weeks of abstinence reduced wound healing complications in patients undergoing reconstructive head and neck surgery to the rates seen in nonsmokers.⁶⁸ They also reported that even a 1- to 3-week smoke-free period appeared to reduce the incidence of impaired wound healing, although the number of “late quitters” was too small to draw statistically significant conclusions. Another recent study found that patients who quit smoking 4 weeks before undergoing reduction mammoplasty experienced substantially fewer wound healing complications.⁶⁹

Moller and colleagues conducted the first randomized controlled trial evaluating the impact of an intensive smoking-cessation program on orthopaedic surgery outcomes.⁶⁴ They found that patients who completed 6 to 8 weeks of intensive smoking-cessation intervention before surgery cut their postoperative complication rate in half compared with the control group. These findings were substantiated by Lindstrom and colleagues⁶⁷ in general surgery, as they reported similar results for patients who received intensive smoking-cessation interventions 4 weeks before and after surgery. A recent meta-analysis found that smokers have a higher incidence of healing complications across all surgical specialties, and 4 weeks of smoking cessation before surgery substantially reduces surgical site infections.⁷⁰

Despite these findings, there has been some concern among clinicians that brief preoperative abstinence might actually increase the risk of pulmonary complications, and that cessation must occur at least 8 weeks before surgery.^{60,71} This concern is based largely on an assumption that smoking cessation might lead to a decrease in coughing and an increase in sputum production, thereby predisposing a patient to infection.⁷² However, a recent meta-analysis by Myers and colleagues⁷³ found that “there is currently no suggestion, either from any single study or from combinations of studies, that quitting smoking shortly before surgery increases postoperative com-

plications.” Surgeons can safely encourage preoperative smoking cessation at any time before surgery without reservation.

Techniques to promote preoperative smoking cessation

Despite expressing a desire to quit, most smokers find it very difficult to do so and require multiple attempts before quitting for good. There are a number of effective interventions that health care providers, and surgeons in particular, can introduce to increase the likelihood of success. Surgeons should use either the 5 A’s (Ask, Advise, Assess, Assist, Arrange), or the simpler Ask-Advise-Refer strategy to open dialogue on a patient’s smoking status, and recommend the use of telephone quit lines, individual counseling, or group counseling when appropriate. These interventions have been shown to be effective in helping patients develop a personalized quit plan, obtain social support, and devise problem-solving strategies.⁶²

Pharmacotherapy also has a vital role in helping patients quit. The use of medication doubles the rate of abstinence and studies have shown that the combination of counseling and medication is superior to either alone.⁶² Nicotine replacement therapy (NRT) is a powerful smoking-cessation tool and can be administered through a number of delivery systems including gum, lozenge, spray, and patches. Given nicotine’s cardiovascular effects, there has been some concern about the safety of NRT in surgical patients. However, there is currently no evidence to suggest that NRT adversely affects surgical outcomes and it must be considered preferable to continued smoking during the perioperative period.^{64,74} One recent study found that supplementing counseling with NRT increased the likelihood of cessation by 50% to 70% without any increase in wound-healing complications.⁷⁵ In addition, a review of 11 randomized controlled trials found that 4 weeks of intensive smoking-cessation interventions, defined as individual counseling plus NRT, substantially reduced the incidence of perioperative complications, and further increased the likelihood of continued abstinence 12 months later.⁷⁶ Interestingly, the effects of less intensive interventions were not significant. Available NRT options are summarized in Table 3.⁷⁷ Sur-

Table 3. Nicotine Replacement Therapy Options for Smoking Cessation

Therapy option	Dose	Recommended length of treatment
Gum	2 mg and 4 mg	Up to 12 wk
Patch	7 strengths: 5, 7, 10, 14, 15, 21, 22 mg; 16- or 24-hour release	6 to 10 wk
Lozenge	2 mg and 4 mg; 1 lozenge every 1 to 2 hours when awake	Up to 12 wk
Nasal spray	0.5 mg per spray; 1 to 2 doses every hour, not to exceed 40 doses per day	3 to 6 mo
Inhaler	4 mg per cartridge; 1 cartridge every 1 to 2 hours when awake; 6 to 16 cartridges per day	Up to 6 mo

Adapted from Schroeder SA,⁷⁷ with permission.

geons should determine which agent to use based on patient preference, smoking habits, and tolerance of adverse effects. Varenicline and bupropion are additional agents shown to be efficacious and cost effective, but these medications should be used with caution, given recent FDA black box warnings highlighting the potential for serious cardiovascular and mental health events.

DISCUSSION

In this article, we reviewed the current literature on the impact of active smoking on surgical outcomes. Our findings indicate that smoking substantially increases the risk of cardiac, respiratory, and septic complications after surgery. Smoking is also linked to inferior long-term surgical outcomes, decreased patient satisfaction, and increased overall costs to the health care system. Importantly, smoking abstinence can avert these negative consequences, and the scheduling of elective surgery presents a valuable and presently underused opportunity to initiate smoking-cessation interventions.

We also examined previous concerns that stopping smoking only a few weeks before surgery might actually worsen outcomes. Clearly, the longer the duration of preoperative abstinence the better, but there is no reason to hesitate to recommend abstinence at any time before surgery. A growing body of evidence provides strong support for the concept that perioperative abstinence reduces these risks, without any credible evidence that abstinence of any duration increases risk.^{26,73,78}

In some nations, active smokers are not offered elective surgery. For example, a new National Health Service policy in Great Britain requires all smokers awaiting elective sur-

gery to take a several-week smoking-cessation course before surgery. Perhaps a similar mandate should be considered in this country, as the health reform debate moves forward. A key principle that has been missing from the health reform debate is patient responsibility and accountability for personal behaviors that result in disease and disability, and increased health care costs. The financial burden to society from active smoking is substantial, and given the ill health of the economy, our nation might now have an additional motivation to implement stronger measures to curb tobacco's deadly toll.

As additional prospective data are accumulated on the adverse impacts of smoking on surgical outcomes, the opportunity exists to develop new pay for performance and federal mandates to reduce reimbursement for surgical complications that result from ineffective smoking-cessation efforts preoperatively. The central challenge to the development of these efforts is the lack of robust methods for surgeons to convince those patients who are active smokers to stop smoking preoperatively (Table 4). Most tobacco interventions have a successful quit rate under 10%, so penalizing surgeons for the inability to convince active smokers to quit smoking before an operation will likely be regarded as punitive rather than constructive. Instead, national efforts involving surgical professional societies and encouraging the wider adoption and use of the Ask-Advise-Refer strategy might be the first place to start.

There is also evidence about the impact of alcohol and marijuana on surgical outcomes. Studies have found that hazardous alcohol consumption can increase the risk of postoperative events, including infections, cardiopulmonary complications, and bleeding, in addition to delirium tremens.^{79,80} Chronic marijuana use has been linked with tolerance to anesthetic agents, which increases the amount of anesthetic required during surgery.^{81,82} However, the national burden of marijuana is much lower than that of cigarettes, as fewer patients are addicted to marijuana and users generally smoke in lower amounts and less frequently.⁸³

Our review of the existing literature suggests that a deeper understanding and estimate of the economic costs of prolonged hospitalizations, readmissions, and complications after surgery related to active smoking is necessary. In addition, there exists a need to develop effective strategies to reward surgeons who succeed in convincing their patients to stop smoking and to incentivize surgeons who are not currently taking the time to counsel their patients to stop smoking. Ultimately, penalties for poor performance by surgeons might become necessary.

Table 4. Barriers with Current Smoking Cessation Interventions

Preoperative
Approximately 10 million smokers undergo surgery every year ⁵⁵
Many surgeons underestimate the impact that preoperative smoking cessation can have on postoperative outcomes, or are unaware of the 5 A's ⁵⁸
50% of surgeons do not currently counsel patients to discontinue smoking preoperatively ⁵⁸
Efficacy of smoking-cessation therapies ranges from 5% to 30% ⁵
Combined pharmacologic and psychosocial approaches are more successful than either alone, but are time consuming
Less than 5% of smokers are able to quit through an attempt without assistance ⁵
The responsibility to offer smoking-cessation counseling preoperatively is shared (and diffused) among anesthesiologists, surgeons, nurse practitioners, and other perioperative personnel
Not all health care providers are aware of the availability of cotinine testing to screen active smokers, or to use carbon monoxide breathalyzer bedside testing to evaluate smoking intensity
Refusal by one surgeon to operate on an active smoker can result in the patient seeking care elsewhere by a surgeon willing to offer surgery
Postoperative
Cessation programs can result in short-term smoking abstinence, but relapse rates can be as high as 90% at 6 months ⁸⁴
25% of patients undergoing surgery continue to smoke during the perioperative period ²⁶
A shortage of randomized controlled trials examining the effects of perioperative smoking-cessation interventions exists
Not all hospitals in America are smoke free, and some allow patients to continue smoking on campus
Tracking the adverse outcomes of smoking on surgical outcomes such as pneumonia, unplanned intubation, myocardial infarction, wound infections, sepsis, shock, and death are difficult to obtain prospectively

*Ask, Advise, Assess, Assist, Arrange.

CONCLUSIONS

One of the most powerful times to convince a smoker to quit is before a surgical procedure or after diagnosis of a smoking-related illness. The time has arrived for surgeons to assume the leadership role and catalyze constructive change to minimize the impact of tobacco in the perioperative setting in America. A partnership between surgeons and policy makers could dramatically improve health outcomes.

Author Contributions

Study conception and design: Maa

Acquisition of data: Khullar, Maa

Analysis and interpretation of data: Khullar, Maa

Drafting of manuscript: Khullar

Critical revision: Maa

Acknowledgment: The authors would like to thank Pamela Derish in the University of California, San Francisco, Department of Surgery Publications Office for writing assistance, and to Dr Steven Schroeder for assistance in conception of this article and allowing reproduction of Table 3.

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