

Smoking Cessation Information Sheet

As vascular surgeons we are uniquely positioned and obligated to counsel our patients in smoking cessation.

Prevalence: Is smoking still a problem?

In 2018, smoking cigarettes was still the leading preventable risk factor for early death and disease worldwide, claiming more than 5 million lives annually (1). Prevalence has been decreasing since the Surgeon General's seminal report on smoking in 1964, but still remains significant: 12% of Canadians over the age of 15 years old still smoke in 2022 survey (2). In a 2017 study, more than one-third of patients who underwent surgery in a Canadian vascular center continue to smoke cigarettes (3).

Clinical Impact: Why should your patient quit?

Non-vascular health impact includes smoking-attributed deaths from cancer (34%), cardiovascular diseases (32%), and respiratory disease (21%) (4). There are extensive adverse effects on vascular biology which become drivers of vascular disease including: endothelial dysfunction, prothrombotic, proinflammatory state, sympathomimetic effects on increasing blood pressure, insulin resistance and altered lipid metabolism (5, 6). There is a rapid decline in cardiovascular risk and major adverse cardiovascular events within a few years after smoking cessation (7).

Peripheral Arterial Disease

Smoking after lower extremity bypass surgery results in a threefold increased risk of graft failure and a number needed to harm of only four. For smokers, this means that 57% of graft failure can be attributed to smoking (8). There is a clear dose-response relationship, with decreased patency in heavy smokers compared with moderate smokers (8). Those who smoke more than 1 pack per day have a higher risk of major adverse limb events and amputation at 1-year follow-up (9).

Smoking cessation, even if instigated after the operation, restored graft patency towards the patency of never smokers (8, 10). Former smokers mimic nonsmokers at 5-year outcomes for overall survival, amputation-free survival, limb salvage and freedom from intervention (8, 10). Smoking cessation led to improved claudication symptoms, improved walking distance, improved patency of bypass grafts, and increased amputation-free survival (11).

Aneurysmal Disease

There is a strong association between smoking and the risk of developing abdominal aortic aneurysms. A positive dose-response relationship was observed between increasing number of cigarettes smoked per day and pack-years smoked and the risk of abdominal aortic aneurysm. There was a reduced risk with increasing duration of smoking cessation with a risk similar to that of never smokers by 25 years of smoking cessation (12).

Smoking cessation 30 days before open AAA repair reduced perioperative morbidity and mortality. This benefit was not seen with patients undergoing endovascular repairs (13).

Carotid Artery Stenosis

There is a dose-response impact of smoking on progression of carotid plaque (14). Smokers were more likely to be younger, to have a symptomatic presentation, to have higher anatomic risk, more likely to have emergent surgery and significantly higher risk for death (15).

Barriers to Quitting: Why doesn't it happen?

The Patient	The Physician
<ul style="list-style-type: none">● Cost: up-front cost of smoking cessation aids versus their insurance coverage versus the cost of cigarettes (\$12-16/pack).● Triggers: Individual to the patient, important to ask your patient what their triggers are (can include living with other smokers, social smoking, alcohol intake, stress)● Misinformation: Many smokers are misinformed about the health risks of smoking cessation aids and these misperceptions impede not only the adoption of therapy but also compliance during treatment (16)● Withdrawal symptoms: Counsel patients that these symptoms will peak at 1-2 weeks but may last longer and include changes in mood, concentration, nausea and headaches	<p>Reasons providers don't engage in smoking cessation with their patients (17, 18):</p> <ul style="list-style-type: none">● Negative attitudes towards smoking patients● Not perceiving smoking as an illness,● Believing that it's other physician's responsibility or the patient's responsibility● Concerns that it will damage the therapeutic alliance● Unfamiliar with pharmacologic therapies, or uncomfortable with behavioural support techniques● Perception of not having enough time to devote to counselling

The Method: How to quit?

Health Provider Counselling- 5 A's Model for Brief Physician Advice

1. Ask	<p>Make asking about smoking cessation a vital sign at every visit.</p> <p>Interventions as brief as three minutes can increase cessation rates: 14.4% (11.3-17.5%) vs. 11% with no intervention, OR 1.4) (19). Substantial evidence supports the effectiveness of brief advice by physicians versus no advice (20). In particular, brief smoking cessation counseling by a vascular surgeon increased patient interest in smoking cessation, increased smoking reduction and cessation rates (40% vs. 30%, OR 1.96). These effects were durable at 3 and 6 months after interventions (21-23).</p>
2. Advise	<p>Advise every user to quit: this needs to be a clear, strong and personalized approach about why they should quit.</p>
3. Assess	<p>Assess willingness to quit. All patients should be routinely offered treatment (20).</p> <p>If unwilling use the 5 R's: Relevance of quitting to patient's situation, Risks of ongoing tobacco use, Rewards of quitting, Roadblocks patients face, Repeat (19).</p>
4. Assist	<p>Combination of brief physician advice, pharmacologic prescription and active referral to telephone-based smoking cessation counseling shown to be more effective for smoking cessation than when these techniques are used alone (combined quit rate 15.2% over 6 months compared with a quit rate of 8.6% with usual care) (20, 23-24).</p> <p>No high-certainty of evidence or consensus to help choose among first-line pharmacologic therapies, final decision reflects patient preference and insurance.</p> <p>Evidence suggests that neither reducing smoking to quit nor quitting abruptly results in superior quit rates; people can be given a choice of how to quit (25).</p> <p>Engaging patients with quit line services can be enhanced when electronic health records send electronic referrals directly to quit lines, which then call the patient to offer services (26-27).</p>
5. Arrange Follow Up	<p>Relapse often occurs within the first 3 months after quitting and continued intervention during that period is essential for sustained cessation. Studies support repeat exposure improves smoking cessation rates (28).</p> <p>Encourage: Most smokers start trying to quit at least 6 times before they are finally successful (19).</p>

Pharmacologic Therapy

Nicotine Replacement Therapy (NRT):

- **How does it work:** Reduce motivation to smoke and reduce nicotine withdrawal symptoms (20).
- **How effective:** NRT's increase the rate of quitting by 50-60%. There is high-certainty evidence that dual-form NRT (fast-acting form + patch) results in higher long-term quit rates than single form (RR 1.25) (20, 29).
- **Form:** High-quality evidence that all of the licensed forms of NRT (gum, transdermal patch, nasal spray, inhaler and sublingual tablets/lozenges) can help people who make a quit attempt and increase their chances of successfully stopping smoking (20).
- **Timing:** Starting NRT 2 to 4 weeks before a planned quit date rather than on the quit date, may enhance NRT effectiveness. Nicotine therapy preloading was associated with a higher cessation rate (17% vs 14%) than starting NRT on the planned quit date (29).
- **Cost:** patch \$20/week + fast-acting \$10-40/week, up-front \$200-240 + \$120-800
- **Dosing:** Based on amount of smoking and type of NRT: patch 14-21mg + short-acting for 10-12 weeks (23). Under-dosing of NRT is likely to contribute to the poorer treatment outcomes seen among people who smoke heavily (30).
- **Barriers:** Biggest identified barrier was negative beliefs about NRT due to knowledge gaps filled by peers/media that were negative. As their physician you can be a reliable source of information to increase patient confidence in NRT safety and effectiveness (31).
- **Side effects:** Minor irritation of the site through which it is administered, and in rare cases can cause non-ischemic chest pain and palpitations.

Varenicline:

- **How does it work:** Partial mixed nicotinic receptor agonist and antagonist, therefore works as a combination of maintaining levels of dopamine to counteract withdrawal symptoms (agonist) and reducing smoking satisfaction (antagonist) (20, 32).
- **How effective:** High-certainty evidence that varenicline is more effective at helping people to quit smoking (23%) than placebo (9%, RR 2.32), bupropion (18%, RR 1.36), and single form NRT (18%, RR 1.25). No clear evidence of a difference in quit rates between varenicline and dual-form NRT (RR 1.02) (32, 33).
- **Cost:** \$25/week, up-front \$300-600
- **Dosing:** Start 0.5mg daily for 3 days then increase to 0.5mg BID for 4 days then 1mg BID for 12 weeks, target quitting second week (20).
- **Barriers:** Moderate-certainty evidence that people taking varenicline are more likely to report side effects (SE) than those not taking it (RR 1.23) (32). While evidence suggests there is an increased risk of cardiac SE and decreased risk of neuropsychiatric SE, in both cases the evidence was limited by imprecision, and confidence intervals were compatible with both benefit and harm (33). No clear evidence of difference in rates of SE between varenicline and bupropion (RR 0.89) (32).
- **Side effects:** Neuropsychiatric SE including insomnia, vivid dreams, headaches, weight change, agitation, depression, suicidal ideation.

Bupropion:

- **How does it work:** Atypical antidepressant blocks neuronal reuptake of dopamine and norepinephrine and serves as nicotinic acetylcholinergic receptor antagonist (34).
- **How effective:** High-certainty evidence that bupropion increased smoking cessation rates (19%) when compared to placebo or no pharmacological treatment (12%) (RR 1.60). However, bupropion resulted in lower smoking cessation rates to varenicline (RR 0.73), and to dual-form NRT (RR 0.74). There was insufficient evidence to establish whether combination of bupropion and NRT resulted in superior quit rates to NRT alone. Additionally, there was insufficient evidence of a difference in efficacy between bupropion and single-form NRT (34).
- **Cost:** \$4-13/week, up-front \$50-150
- **Dosing:** Start 150mg daily for 3 days then 150mg BID, and target quitting the second week of treatment then use a maintenance therapy for 7-12 weeks (34).
- **Barriers:** There is high-certainty evidence that people taking bupropion are more likely to discontinue treatment due to side effects compared with people receiving placebo or no pharmacological treatment (34).
- **Side effects:** Neuropsychiatric side effects including seizures, depression, anxiety, agitation, insomnia. Contraindicated in patients with seizure disorder, and those taking monoamine oxidase inhibitors.

E-cigarettes:

- **How does it work:** Deliver tobacco-free aerosolized nicotine. Marketed as cigarette alternatives and smoking cessation tools.
- **How effective:** E-cigarettes are controversial as cigarette smoking aids due to a small number of high-quality randomized trials, limited evidence on current devices, and uncertainty about possible health risks of long-term use (20, 24).
 - However, a more recent meta-analysis of randomized control trials demonstrated a robust benefit at longer-term (>6 months) follow-up with the use of nicotine e-cigarettes in increasing smoking abstinence and found e-cigarettes to be more efficacious than conventional nicotine replacement or behavioral therapies (35).

Resources

SVS: <https://vascular.org/patients-and-referring-physicians/conditions/smoking-cessation>

CSVS: <https://canadianvascular.ca/Smoking-Cessation-Information-and-Strategies>

CDC: <https://www.cdc.gov/tobacco/campaign/tips/quit-smoking/index.html>

Health Canada: <https://www.canada.ca/en/health-canada/services/smoking-tobacco/quit-smoking/provincial-territorial-services.html>

Alberta: <https://albertaquits.healthiertogether.ca/>

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