

Vapes and Snus: What the ESC Says About Cardiovascular Risk

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Clinicians routinely encounter patients using electronic cigarettes and smokeless tobacco products, often with the assumption these are safer alternatives to combustible cigarettes. The European Society of Cardiology (ESC) has now issued a position paper, providing a much-needed framework for understanding the cardiovascular implications of these products.¹

This guidance directly addresses the clinical uncertainty surrounding vapes and snus, offering a clear stance on their role in tobacco harm reduction and the specific cardiac risks they pose.

KEY TAKEAWAYS

- **The Pivot:** The ESC now explicitly states that e-cigarettes and snus are not harmless and carry distinct cardiovascular risks, moving beyond a simple 'less harmful' narrative.
- **The Data:** E-cigarettes increase heart rate and blood pressure acutely, while snus use correlates with higher risks of fatal myocardial infarction and stroke.
- **The Action:** Advise patients that all nicotine products, including vapes and snus, are detrimental to cardiovascular health, and cessation of all forms of tobacco and nicotine is the optimal goal.

The widespread adoption of electronic cigarettes (e-cigarettes) and smokeless tobacco products, particularly snus, has presented a significant challenge for clinicians. Patients frequently perceive these products as benign or, at minimum, a harmless step down from traditional cigarettes. This perception often stems from aggressive marketing and a lack of clear, consolidated medical guidance on their long-term cardiovascular effects. The European Society of Cardiology (ESC) has stepped in to address this gap, providing a comprehensive position on the cardiovascular risks associated with these nicotine delivery systems.

The ESC position paper, developed by a task force of cardiologists, pulmonologists, and public health experts, consolidates existing evidence to inform clinical practice. It aims to equip European GPs and specialists with the necessary information to counsel patients effectively, moving beyond anecdotal evidence or industry claims. The paper meticulously dissects the mechanisms of harm, distinguishing between the various components and delivery methods of e-cigarettes and snus.

Dissecting the Cardiovascular Impact of E-Cigarettes

E-cigarettes, often marketed as 'vapes,' deliver nicotine by heating a liquid (e-liquid) to produce an aerosol. This aerosol contains nicotine, flavourings, propylene glycol, vegetable glycerin, and other chemicals. The ESC paper highlights that while e-cigarettes eliminate many combustion products found in traditional cigarettes, they introduce their own set

of cardiovascular hazards. The primary concern revolves around nicotine itself, which is a potent vasoconstrictor and sympathomimetic agent.

Nicotine acutely increases heart rate and blood pressure. Studies consistently show an immediate elevation in systolic blood pressure by 5-10 mmHg and diastolic blood pressure by 3-5 mmHg following e-cigarette use. Heart rate also typically rises by 10-20 beats per minute. These acute hemodynamic changes, while transient, can contribute to endothelial dysfunction and arterial stiffness over time, particularly in individuals with pre-existing cardiovascular conditions. The repeated exposure to these acute stressors raises concerns about long-term consequences, including accelerated atherosclerosis and increased risk of thrombotic events.

Beyond nicotine, other components of e-cigarette aerosols contribute to cardiovascular risk. Ultrafine particles, similar to those found in air pollution, can penetrate deep into the lungs and enter the bloodstream, triggering systemic inflammation and oxidative stress. Flavouring chemicals, such as diacetyl and cinnamaldehyde, have demonstrated cytotoxic effects on endothelial cells in vitro, suggesting a direct damaging effect on blood vessel walls. The heating process itself can generate new toxic compounds, including carbonyls and volatile organic compounds, which further exacerbate cardiovascular strain.

The ESC position is unequivocal: e-cigarettes are not harmless. While they may be less harmful than combustible cigarettes for established smokers who cannot or will not quit nicotine entirely, they are not a safe alternative for non-smokers or for those aiming for complete nicotine cessation. The evidence does not support their use as a primary cessation tool without medical supervision, and their long-term safety profile remains largely unknown, especially concerning novel devices and e-liquid formulations. For a deeper understanding of cardiac physiology and disease, clinicians might consult Braunwald's Heart Disease, a comprehensive reference in cardiology.

Snus: A Different Pathway to Cardiac Risk

Snus, a moist, finely ground tobacco product typically placed under the upper lip, is prevalent in Scandinavian countries but gaining traction elsewhere. Unlike e-cigarettes, snus does not involve combustion or aerosol inhalation. But it delivers high doses of nicotine directly into the bloodstream through oral absorption. The ESC paper addresses snus separately, acknowledging its distinct risk profile.

The primary cardiovascular risk from snus stems from its high nicotine content and the presence of tobacco-specific nitrosamines (TSNAs). Nicotine, as with e-cigarettes, drives acute increases in heart rate and blood pressure. Chronic snus use has been associated with sustained hypertension. Multiple epidemiological studies have linked snus use to adverse cardiovascular outcomes. A meta-analysis of observational studies found that snus users had a 27% higher risk of fatal myocardial infarction (RR 1.27; 95% CI, 1.09-1.48) and a 30% higher risk of stroke (RR 1.30; 95% CI, 1.07-1.57) compared to non-users. These are not trivial increases.

But the ESC notes a critical distinction: snus does not appear to increase the risk of chronic obstructive pulmonary disease (COPD) or lung cancer, given its smokeless nature. This makes it a different beast from combustible tobacco. Still, the cardiovascular risks are clear. The paper highlights that while snus may be less harmful than smoking for individuals who switch completely, it is not a risk-free product. For non-smokers, initiating snus use introduces significant cardiovascular hazards that would otherwise be avoided.

The ESC's Unified Stance on Nicotine

The overarching message from the ESC is that all forms of nicotine delivery, whether through combustion, aerosol, or smokeless tobacco, carry cardiovascular risks. The paper explicitly states that e-cigarettes and snus should not be promoted as safe alternatives to smoking. Instead, the focus for clinicians must remain on complete cessation of all nicotine and tobacco products. This includes advising patients against dual use, where individuals use both traditional cigarettes and e-cigarettes or snus, as this offers no clear health benefit and may even increase overall exposure to harmful substances.

The ESC recommends that healthcare professionals routinely screen for the use of all tobacco and nicotine products, including e-cigarettes and snus. They should provide clear, evidence-based advice on the cardiovascular harms and offer support for cessation. This support should align with established guidelines for tobacco cessation, which include behavioural counselling and pharmacotherapy. The paper acknowledges the challenge of addressing the 'harm reduction' narrative, but it firmly positions cardiovascular health as paramount, advocating for a zero-tolerance approach to nicotine exposure where possible.

The open-label nature of many studies on e-cigarettes and snus is an obvious caveat, as blinding is often impossible. The heterogeneity of e-cigarette devices and e-liquids also complicates research, making it difficult to generalise findings across the rapidly evolving market. Still, the consistent physiological responses to nicotine across various products provide a strong basis for the ESC's recommendations. Clinicians seeking practical guidance on managing patients with cardiovascular conditions might find the Oxford Handbook of Cardiology a useful resource.

The next trial needs to show long-term, randomised data on cardiovascular events in former smokers who switch completely to e-cigarettes versus those who achieve complete nicotine abstinence. Until then, the ESC's position remains a pragmatic, evidence-based warning.

CLINICAL IMPLICATIONS

The ESC's position paper cuts through the marketing noise surrounding e-cigarettes and snus, providing a much-needed dose of clinical realism. GPs and specialists must now unequivocally advise patients that these products are not harmless. The notion that they are a 'safe' alternative to smoking is a dangerous misconception that we must actively counter in every consultation.

For patients currently using these products, particularly those with existing cardiovascular disease, the message is clear: complete cessation of all nicotine is the optimal goal. We cannot simply endorse a switch from one form of nicotine delivery to another without acknowledging the ongoing cardiovascular risks, including acute hemodynamic changes and potential long-term endothelial damage.

The industry's 'harm reduction' narrative, while appealing in theory, often overlooks the critical distinction between reducing harm and eliminating it. Clinicians should leverage established cessation strategies, including pharmacotherapy and behavioural support, rather than tacitly approving e-cigarettes or snus as a 'lesser evil.' Our role is to advocate for the best possible health outcomes, which means freedom from all nicotine dependence.

This guidance also underscores the need for ongoing vigilance. The rapid evolution of nicotine products means that today's 'safer' alternative could be tomorrow's established cardiovascular risk. We must remain critical consumers of new product claims and rely on robust, independent research to inform our patient counselling.

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