

Vapes, Snus, and Nicotine: What Cardiologists Must Know About ESC's New Stance

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Cardiologists routinely advise patients on smoking cessation, a cornerstone of cardiovascular risk reduction. But the proliferation of novel nicotine delivery systems, from e-cigarettes to snus, has introduced a complex grey area, leaving many clinicians uncertain about their role in harm reduction or outright cessation.

The European Society of Cardiology (ESC) recently published a policy statement addressing these products, providing a much-needed, albeit stark, clarification on their cardiovascular implications and offering a framework for clinical guidance.

KEY TAKEAWAYS

- **The Pivot:** The ESC now explicitly states that all nicotine-containing products, including e-cigarettes and snus, are not harmless and carry cardiovascular risks.
- **The Data:** E-cigarettes increase the risk of myocardial infarction by 1.79 times and stroke by 1.71 times compared to non-users.
- **The Action:** Clinicians should advise all patients to avoid nicotine products, including e-cigarettes and snus, and treat them as a cessation target, not a harm reduction tool for non-smokers.

For decades, the message to patients has been clear: smoking kills. The link between combustible tobacco and cardiovascular disease (CVD) is irrefutable, driving countless public health campaigns and clinical interventions. But the market has evolved, introducing a dizzying array of nicotine products that promise a 'safer' alternative, or at least a less harmful one, than traditional cigarettes. This shift has created a dilemma for clinicians, particularly cardiologists, who must navigate patient inquiries about vaping, snus, and heated tobacco products.

The European Society of Cardiology (ESC) recognized this growing clinical ambiguity, prompting its Tobacco Control Committee to develop a comprehensive policy statement. This statement, a consensus document drawing on available evidence, aims to equip cardiologists and other healthcare professionals with clear, evidence-based guidance on the cardiovascular risks associated with these novel nicotine delivery systems. It addresses electronic cigarettes (e-cigarettes), heated tobacco products (HTPs), and smokeless tobacco (snus), distinguishing their risks from combustible cigarettes while firmly rejecting the notion of their harmlessness.

Understanding the New Nicotine Landscape

E-cigarettes, often marketed as 'vapes,' deliver nicotine by heating a liquid (e-liquid) to produce an aerosol that users inhale. This e-liquid typically contains nicotine, propylene glycol, vegetable glycerin, and flavourings. Unlike combustible cigarettes, e-cigarettes do not involve the burning of tobacco, which eliminates many of the toxic byproducts

of combustion, such as tar and carbon monoxide. But they still deliver nicotine, a highly addictive substance with known cardiovascular effects. The ESC statement highlights that the cardiovascular system is particularly vulnerable to nicotine's acute and chronic effects, including sympathetic activation, endothelial dysfunction, and increased oxidative stress. These mechanisms contribute to increased heart rate, blood pressure, and arterial stiffness.

Heated tobacco products (HTPs), such as IQOS, are another category. These devices heat specially designed tobacco sticks to a temperature sufficient to release an aerosol containing nicotine and other chemicals, but below the point of combustion. Proponents argue HTPs reduce exposure to harmful chemicals found in cigarette smoke. But the ESC policy statement points out that while some toxicants are reduced, others remain, and the long-term cardiovascular impact is still largely unknown. Snus, a moist powder tobacco product placed under the lip, is popular in Scandinavia. It is smokeless, but delivers high levels of nicotine and other tobacco-specific nitrosamines (TSNAs), known carcinogens. The ESC specifically addresses snus due to its widespread use in certain European regions and its distinct risk profile compared to smoked tobacco.

The Cardiovascular Evidence Against Novel Nicotine Products

The ESC statement consolidates evidence indicating that e-cigarettes are not benign. A meta-analysis cited within the policy document, encompassing multiple observational studies, revealed that e-cigarette use significantly increases the risk of myocardial infarction (MI) by 1.79 times (95% CI, 1.20-2.66) and stroke by 1.71 times (95% CI, 1.20-2.43) compared to non-users. These are not trivial increases. For patients already at risk of cardiovascular events, adding e-cigarette use to their risk profile is a serious concern. The statement also notes that e-cigarette use acutely elevates heart rate and blood pressure, effects mediated by nicotine's sympathetic stimulation. Chronic exposure to these haemodynamic changes contributes to arterial stiffness and endothelial dysfunction, precursors to atherosclerosis. For heated tobacco products, the evidence base is less mature, but concerning. While HTPs reduce exposure to some toxicants compared to conventional cigarettes, they still expose users to nicotine and other harmful chemicals. The ESC emphasizes that the long-term cardiovascular safety data for HTPs are insufficient to conclude they are safe or significantly less harmful than e-cigarettes. Early studies suggest HTPs induce similar acute cardiovascular effects to e-cigarettes, including increases in heart rate and blood pressure. The policy statement cautions against accepting industry claims of 'reduced risk' without robust, independent, long-term clinical trials.

Snus, despite being smokeless, also carries significant cardiovascular risks. The ESC highlights studies showing that snus use is associated with an increased risk of fatal MI and stroke. One large prospective cohort study in Sweden, for example, found that snus users had a higher risk of MI compared to non-users, although the magnitude was lower than for smokers. The statement clarifies that snus is not a safe alternative to smoking, particularly for individuals with pre-existing cardiovascular conditions. It delivers substantial amounts of nicotine, which contributes to adverse cardiovascular effects, including increased blood pressure and heart rate variability. The presence of TSNAs also raises concerns about long-term oncogenic potential, though the primary focus of this ESC statement remains cardiovascular.

Policy Recommendations and Clinical Implications

The ESC policy statement makes several unequivocal recommendations. First, it asserts that all nicotine-containing products, including e-cigarettes, HTPs, and snus, are harmful to cardiovascular health. They are not 'safe' alternatives to combustible tobacco. Second, the ESC advises against the use of e-cigarettes as a smoking cessation tool, citing

insufficient evidence of long-term efficacy and concerns about dual use (using both e-cigarettes and conventional cigarettes). Instead, the statement advocates for evidence-based pharmacotherapies (nicotine replacement therapy, varenicline, bupropion) and behavioural counselling as the preferred methods for smoking cessation. This aligns with existing guidelines from major health organizations, which prioritize established, well-studied cessation aids. The statement also addresses the critical issue of youth initiation. The appealing flavours and aggressive marketing of e-cigarettes have led to a surge in youth vaping, creating a new generation of nicotine addicts. The ESC calls for stricter regulations on marketing, sales, and flavourings to prevent youth from initiating nicotine use. This public health perspective is crucial, as nicotine addiction in adolescence can lead to lifelong dependence and potential transition to combustible tobacco. The policy also advocates for comprehensive tobacco control policies that apply to all nicotine products, including taxation, advertising bans, and smoke-free legislation. This holistic approach aims to denormalize nicotine use across all forms.

Where the Evidence Falls Short and Future Directions

The open-label nature of many observational studies on e-cigarettes and HTPs is an obvious caveat. Confounding factors, such as prior smoking history, concurrent use of other tobacco products, and lifestyle choices, are difficult to fully adjust for, potentially influencing observed associations. The relatively short history of widespread e-cigarette and HTP use means long-term data, particularly on hard cardiovascular endpoints, are still emerging. Most studies rely on surrogate markers like endothelial function or arterial stiffness, which are predictive but not definitive outcomes. The heterogeneity of e-cigarette devices, e-liquids, and user patterns also complicates research, making it challenging to draw universal conclusions.

The ESC statement acknowledges these limitations but emphasizes the precautionary principle. Given the known cardiovascular toxicity of nicotine and other chemicals present in these products, and the observed increases in MI and stroke risk, a cautious approach is warranted. Future research needs to focus on large, prospective, randomized controlled trials comparing different nicotine delivery systems to established cessation methods and to no nicotine use. These trials must be independently funded and designed to assess long-term cardiovascular morbidity and mortality. Understanding the specific mechanisms by which various e-liquid components and HTP aerosols affect cardiovascular cells and tissues is also a critical area for investigation. The Oxford Handbook of Cardiology offers a concise guide to modern cardiological practice, including risk factor management.

The ESC policy statement serves as a clear directive for cardiologists: treat all nicotine products as a cardiovascular risk. The unanswered question remains whether regulatory bodies will implement the comprehensive policy changes needed to curb the rising tide of novel nicotine product use, particularly among young people, and how this will impact the long-term burden of cardiovascular disease.

CLINICAL IMPLICATIONS

The ESC's policy statement cuts through the marketing noise surrounding novel nicotine products. Clinicians can no longer afford to view e-cigarettes or snus as benign alternatives or acceptable harm reduction strategies for non-smokers. The evidence, while still evolving for some products, clearly indicates cardiovascular harm, demanding a consistent message: nicotine, in any form, is a risk factor. This means actively screening for all forms of nicotine use in cardiovascular patients and integrating cessation

counselling for e-cigarettes and snus with the same urgency applied to combustible tobacco. Relying on unproven 'harm reduction' claims from manufacturers is a disservice to patients who deserve evidence-based guidance. We have effective, approved cessation therapies; those should remain the first line.

The public health implications are substantial. The normalization of vaping, particularly among adolescents, risks creating a new generation of nicotine-dependent individuals who may eventually transition to more harmful tobacco products. Policymakers must heed the ESC's call for stricter regulation on marketing, flavours, and sales to protect vulnerable populations from these products.

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