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E-Cigarettes: “Vaping” Hidden Dangers — More Harmful Than You Think

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Vaping damages blood vessel function, even in the absence of nicotine, by reducing blood flow velocity in the femoral artery and decreasing venous oxygen saturation, which suggests impaired lung oxygen intake

E-cigarettes contain harmful chemicals beyond nicotine, such as lead, nickel and formaldehyde, which cause oxidative stress and inflammation, triggering impaired vascular function and long-term vascular diseases

The misconception that vaping is a safer alternative to smoking is challenged by findings that both nicotine and non-nicotine vapes impair vascular function, with nicotine vapes causing more substantial reductions

EVALI, a severe respiratory condition linked to vaping, remains a significant health concern, with ongoing cases highlighting the need for improved regulatory measures and public health strategies

***The presence of toxic chemicals in e-cigarette vapor causes acute lung injury and systemic effects on multiple organs**, emphasizing the need for further research and regulatory oversight to understand and mitigate these health risks*

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E-cigarette or vaping product use-associated lung injury (EVALI) is a severe respiratory condition linked to the use of vaping products. It’s characterized by symptoms such as shortness of breath, cough, chest pain, and gastrointestinal issues like nausea and vomiting.

EVALI could escalate rapidly, leading to hospitalization or even death. This condition emerged prominently in 2019, raising significant concerns about the safety of vaping as an alternative to traditional cigarette smoking.

EVALI Is Responsible for Thousands of Hospitalizations in the US

A comprehensive workshop report published in the Annals of the American Thoracic Society in September 2022 revealed alarming statistics about EVALI’s health effects.[1] Over the course of the EVALI outbreak, more than 2,800 individuals were hospitalized, and 68 deaths were recorded across the U.S.

The report emphasized that while vitamin E acetate was initially identified as a primary

culprit, approximately 20% of patients had exclusively used nicotine-containing e-cigarettes, indicating that other harmful substances also contribute to lung injuries.

The persistence of EVALI cases, even after the initial outbreak subsided, underscores the ongoing risks associated with vaping.[2] Additional reports from various researchers suggest that EVALI is not merely a relic of the past but an enduring threat to vape users.

EVALI also poses long-term consequences for both vapers and the healthcare system. Patients who recover from EVALI experience lasting respiratory issues, and the healthcare infrastructure faces the burden of treating these severe cases.

Moreover, the misconception that vaping is a safer alternative prevents smokers from effectively quitting smoking, leading to sustained nicotine addiction and its associated health risks. Addressing EVALI is crucial not only for preventing acute lung injuries but also for safeguarding overall public health.

The Focus on Vaping's Health Implications

E-cigarettes contain a variety of harmful chemicals, including vitamin E acetate, which has been identified as a significant contributor to lung injuries. Additionally, the presence of toxic metals and other substances in vaping aerosols causes cytotoxicity and inflammation.

Simply put, the harmful substances in e-cigarettes irritate and inflame the lungs, leading to EVALI. When inhaled, these chemicals damage lung tissue, impair oxygen exchange and trigger an inflammatory response. This inflammation spills over into the bloodstream, affecting other organs and causing long-term health issues.

Diagnosing EVALI could be challenging due to its symptoms overlapping with other respiratory conditions. Clinical assessments often rely on patient history and imaging studies, but these methods do not fully capture the extent of the damage caused by vaping. The lack of specific biomarkers for EVALI further complicates diagnosis, leading to misdiagnoses or delayed treatment.

Conventional treatments for EVALI often involve supportive care, such as oxygen therapy and corticosteroids, but these have their own drawbacks, including side effects like increased blood sugar levels and weakened immune response. Understanding the limitations of these treatments is important for anyone who thinks vaping is a safer alternative to smoking.

New Study Reveals the Damaging Effects of Vaping on Vascular Function

A CNN Health article reported on a study that explored the immediate effects of vaping on vascular health and oxygen levels in the body.[3] The research, which has not yet been published in a peer-reviewed journal but has been presented at the Radiological Society of North America's annual meeting, aimed to determine how using e-cigarettes, with or without nicotine, affects blood vessel function and lung oxygen intake.

The study included 31 individuals between 21 and 49 years old who smoked or vaped, and compared their results with 10 nonsmokers.[4] Participants underwent MRI scans before and

after vaping or smoking tobacco cigarettes to evaluate changes in their vascular and respiratory systems.

The findings indicated that vaping significantly reduces blood flow velocity in the femoral artery, which is vital for supplying oxygenated blood to the lower body. Additionally, oxygen saturation levels among the vapers dropped, indicating that their lungs were likely taking in less oxygen.[5]

One of the notable findings in the study was that vaping with nicotine resulted in the most significant reduction in vascular function, even more than traditional smoking. This challenges the common perception that e-cigarettes are a safer alternative to cigarettes. Furthermore, vaping without nicotine also negatively impacted blood vessel function, though to a slightly lesser extent.[6]

In a CNN Health article, Dr. Marianne Nabbout, lead author of the study and a radiology resident at the University of Arkansas for Medical Sciences in Little Rock, said:

> "People mistakenly believe that electronic cigarettes are safer alternatives to tobacco-based cigarettes, but this is actually not true. Even if there was no nicotine in the e-cigarette, there could be other components that may be harmful. That is possibly why we saw these significant effects, even following non-nicotinized electronic cigarette vaping."[7]

The study emphasized that good vascular function is crucial for maintaining efficient blood flow, delivering oxygen and nutrients, and removing waste from the body. When your blood vessels cannot expand and contract properly, it puts you at risk of serious health issues such as blood clots, high blood pressure and stroke.[8]

Another significant aspect of the research was the reduction in oxygen saturation following vaping. Lower oxygen levels in the blood mean that the body's organs and tissues do not receive the necessary oxygen to function optimally. Over time, this contributes to the development of vascular diseases, posing long-term health risks for regular vapers.[9]

The mechanisms behind these effects involve the inhalation of various chemicals present in e-cigarette vapor. When users vape, they are not just inhaling water vapor; the vapor contains harmful substances like lead, nickel, formaldehyde, propylene glycol and glycerin. These chemicals cause oxidative stress and inflammation in the blood vessels, leading to impaired endothelial function — the ability of blood vessels to dilate and constrict as needed.[10]

Additionally, the study found that even nicotine-free e-cigarettes are harmful due to the presence of other toxic components. This underscores the misconception that e-cigarettes without nicotine are harmless. The combination of these chemicals disrupts the normal functioning of the vascular system, making e-cigarette users more susceptible to cardiovascular diseases.[11]

Experts involved in the study emphasized the need for more research to confirm these findings and to understand the long-term implications of vaping. However, the immediate negative effects on vascular function and oxygen saturation provide compelling evidence

against the notion that vaping is a safe alternative to smoking.

Dr. Albert Rizzo, chief medical officer of the American Lung Association, commented on the study, stating that vaping exposes users to more than just harmless water vapor:

> "We don't know a whole lot about the effects of the ingredients of e-cigarettes with regard to effects on our lungs, effects on our blood vessels, and even though there [are] supposedly less toxins than a regular cigarette, we don't know the long-term effects of these modalities are. Tests like these keep showing there are short-term effects," he said.[12]

The Link Between Vaping and Lung Inflammation

A recent review published in the Annual Review of Physiology journal explored the harmful effects of e-cigarettes on lung health, particularly focusing on inflammation and acute injuries related to vaping.[13] The research aimed to understand how vaping contributes to lung diseases and the underlying mechanisms that cause these health issues.

The study examined various groups, including young adults and nonsmokers who have started using e-cigarettes, and found that e-cigarette use is linked to significant lung inflammation and injuries, and has led to a rise in cases of EVALI.[14]

One of the key findings was that the chemicals in e-cigarette vapor, such as nicotine, causes cytotoxicity, which means they are toxic to cells in the lungs. This cytotoxicity causes inflammation, where the lung tissues become swollen and irritated. The study highlighted that this inflammation is not just a short-term issue but could cause chronic lung diseases over time.[15]

The research also delved into the role of neutrophils, a type of white blood cell, in the inflammation process. Neutrophils are meant to protect the lungs by moving to areas of harm and fighting infections. However, the chemicals in e-cigarettes disrupt their normal function, causing them to overreact and contribute to excessive inflammation. This overreaction damages the delicate structures in the lungs, making them more vulnerable to diseases.[16]

Furthermore, the study found that repeated exposure to e-cigarette chemicals affects multiple organs in the body, not just the lungs. This is because the harmful substances in the vapor enter the bloodstream through the lungs, reaching other parts of the body and causing widespread inflammation and damage.[17]

The mechanisms behind these harmful effects involve the rapid delivery of toxic chemicals into the bloodstream through the lungs. When users inhale e-cigarette vapor, they are not only taking in nicotine but also a cocktail of other harmful substances like heavy metals and toxicants. These substances cause oxidative stress, leading to cell and tissue damage.[18]

> "Suppression of antimicrobial functions of both macrophages and neutrophils by e-cigarette aerosols in vitro and ex vivo supports the concept that e-cigarette use damages host defenses and will lead to increased susceptibility to pulmonary infections," the researchers said.[19]

Additionally, the study pointed out that the variety of chemicals in e-cigarette aerosols makes it difficult to pinpoint a single cause of lung damage. Instead, it is the combination of multiple toxic substances that triggers various health issues.[20] This complexity underscores the need for comprehensive regulations to control the ingredients used in e-cigarette liquids and to protect public health.

These Strategies Will Help You Quit Smoking and/or Vaping

Addressing the damaging effects of vaping requires a comprehensive approach focused on restoring your overall health and strengthening your body from within. By taking these proactive steps to enhance your well-being, you'll create a solid foundation that makes quitting smoking more achievable and less stressful:

- **Get healthy before trying to quit smoking or vaping —** Prioritize improving your overall health to increase your chances of successfully quitting these unhealthy habits. This involves optimizing your diet and ensuring your body is in the best possible condition to handle the challenges of quitting. When your body is healthy, it will better cope with the withdrawal symptoms and stresses associated with giving up nicotine.
- **Optimize your diet with a focus on cellular energy production —** Tailor your diet to support cellular energy production, which is crucial for your body's repair and functioning. Incorporate foods that enhance mitochondrial health, such as those rich in antioxidants and essential nutrients. A well-balanced diet will provide the necessary fuel for your cells, promoting better vascular health and reducing the immediate impacts caused by vaping.
- **Exercise regularly —** Engage in regular physical activity to boost your cardiovascular health and increase your energy levels. Exercise helps improve blood flow, strengthens blood vessels and enhances oxygen delivery throughout your body. As you become more physically fit, your body will be better equipped to recover from the vascular stress caused by vaping, making the process of quitting smoking smoother.
- **Build energy and reduce stress to facilitate quitting —** As you adopt a healthier lifestyle through diet and exercise, you'll naturally experience increased energy and reduced stress levels. This improvement in your overall well-being will make the decision to quit smoking less daunting and more manageable. With higher energy levels and lower stress, you'll find it easier to resist cravings and maintain your commitment to a smoke-free life.
- **Find a healthy emotional outlet —** Many use exercise, meditation or relaxation techniques for this, and these are all great. I also recommend incorporating Emotional Freedom Techniques (EFT). This helps clear out emotional blockages from your system (some of which you might not even realize are there), thus restoring your mind and body's balance and helping you break the addiction and avoid cravings.

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Global Research's Holiday Fundraiser

Notes

[1, 2] Annals of the American Thoracic Society, Jan 2023;20(1):1-17

[3, 4, 5, 6, 7, 8, 9, 10, 11, 12] CNN Health, November 28, 2024

[13, 14, 15, 16, 17, 18, 19, 20] Annu Rev Physiol. 2021 Nov 1;84:611–629

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