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Vapes help to stop smoking, but not necessarily stop using nicotine

Vapes are an effective aid to quitting smoking tobacco cigarettes. However, they do not help to reduce nicotine dependence. This is shown by the results of the world's largest study on this topic, which was conducted by a Swiss-wide interdisciplinary research group led by the University of Bern.

Vapes, also called e-cigarettes or electronic nicotine delivery systems (ENDS) are electrically powered devices that emit nicotine in the form of vapor. Unlike tobacco cigarettes, they are tobacco-free and deliver significantly lower levels of toxic compounds. Vapes are used by tobacco smokers, among others, to quit smoking cigarettes. So far, however, there is insufficient data on how safe vapes are when they are used over longer periods and as part of intensive smoking cessation counseling, as offered in Switzerland. The world's largest study on this topic has now been conducted, involving researchers from the fields of family medicine, pulmonary medicine, toxicology, addiction medicine and epidemiology with five study centers in Switzerland (Bern, Geneva, Lausanne, Zurich, St. Gallen), led by the University of Bern.

The study compared the efficacy, safety and toxicology of vapes as part of intensive smoking cessation counseling compared to equally intensive smoking cessation counseling without vapes. The smoking cessation counseling in both groups included intensive behavioral support as well as recommendations to use smoking cessation medication and nicotine replacement therapy. The results, which were published in *The New England Journal of Medicine*, show that vapes are more effective for smoking cessation than conventional smoking cessation counseling without vapes, and they have few side effects. However, they do not help to kick the nicotine habit. "Our study confirms previous findings that vapes are effective to quit smoking tobacco. It also shows the benefits they bring in the context of intensive smoking cessation counseling, as we have in Switzerland," says Reto Auer, study leader from the Institute of Primary Health Care (BIHAM) at the University of Bern and from Unisanté, University Center for Primary Care and Public Health in Lausanne.

Abstinence from tobacco, but ongoing nicotine use

Over a period of six months, a total of 1,246 participants in the two groups were surveyed and clinically examined in the five study centers in German-speaking and French-speaking Switzerland. Health-related adverse events were recorded in detail. The results showed that the addition of vapes to intensive smoking cessation counseling increased abstinence from tobacco smoking by 21%. The abstinence rate from tobacco smoking was 53% in the group with vapes and 32% in the group without

vapes (67% more abstinence with vapes compared to no vapes). However, many people who stopped smoking tobacco continued to use vapes and thus with nicotine. Accordingly, nicotine abstinence was lower in this group. The difference was 14% (20% nicotine abstinence in the group with vapes compared to 34% in the group without vapes).

Vapes could lead to fewer tobacco-related symptoms

In terms of side effects, serious adverse events did not occur more frequently in the group with vapes than in the group without vapes. "This speaks for the safety of vapes in smoking cessation counseling in light of the study's large scope," says Auer. On the other hand, more mild side effects such as airways irritation were found. "This can be explained, among other things, by the fact that the nicotine in vapes irritates the throat more than conventional cigarettes, which contain additives to alleviate precisely these symptoms," explains Auer. Health problems such as cough and sputum production were lower in the group with vapes than in the control group (41% less participants reporting cough compared to 34%). "Cough and sputum production are typical symptoms of smoker's lung. A reduction in these symptoms could indicate that smokers who switch to vapes completely and stop smoking tobacco could suffer less from tobacco-related diseases in the long term, even if they continue to use vapes," explains Martin Brutsche, pulmonologist, and head of the study center in St. Gallen. However, according to the researchers, long-term studies are needed to confirm the health benefits compared to continued smoking. "Most smoking-related illnesses are caused by toxic and carcinogenic substances in tobacco and not by nicotine," continues Martin Brutsche.

"Most smokers want to stop smoking tobacco cigarettes, but many are unable to do so even with available, established, scientifically proven smoking cessation products. This is where vapes could help as part of a smoking cessation counseling," adds Isabelle Jacot-Sadowski, who was involved in the Lausanne study center.

Possible two-stage approach to nicotine addiction

The researchers see a pragmatic approach in recommending vapes to smokers instead of leaving them alone with their dependence and the health consequences of their habit. "By using vapes, smokers could reduce the risk of tobacco-related diseases until they later decide to stop using nicotine altogether," says Isabelle Jacot-Sadowski. Vapes therefore enable a two-stage approach: first quitting tobacco and then quitting the vapes, and thus nicotine.

No easy access to vapes recommended

Vapes are not risk-free. Even though vapes release far fewer toxic substances than tobacco cigarettes, they still release carcinogenic substances and nicotine can lead to addictive behavior, especially among young people. Accordingly, a sharp increase in vaping among young people is being observed with concern in many Western countries. "Adolescents and non-smokers should breathe in fresh air rather than vaping. It is therefore important to ensure that access to vapes is sufficiently regulated," says Auer. The researchers emphasize that the study only examined the use of vapes in people willing to quit smoking and in conjunction with smoking cessation counseling. "We therefore advocate that vapes could be suggested to smokers as part of smoking cessation counseling, but that non-smokers should not have easy access to vapes, nor to tobacco cigarettes and other nicotine-containing products," explains Auer.

Publication details:

Reto Auer et al: *Electronic Nicotine-Delivery Systems for Smoking Cessation*, The New England Journal of Medicine, 390:7,15.2.2024, [doi:10.1056/NEJMoa2308815](https://doi.org/10.1056/NEJMoa2308815) (with video)

Editorial by Nancy A. Rigotti, M.D.: *Electronic Cigarettes for Smoking Cessation – Have We Reached a Tipping Point?*, The New England Journal of Medicine, 390:07, 15.2.2024

Information on the overall ESTxENDS study (at national level, in Bern and the surrounding area):

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The ESTxENDS study

ESTxENDS stands for *Efficacy, Safety and Toxicology of Electronic Nicotine Delivery Systems as an Aid for Smoking Cessation*. The study phase took place from 2018 to 2021. It involved 1246 adult smokers who smoke at least five tobacco cigarettes per day and who were willing to set a quit date in five study centers in Switzerland (Bern, Geneva, Lausanne, Zurich and St. Gallen), making it the largest published study in the world to date. Half of the group received vapes and various e-liquids to choose from in addition to smoking cessation therapy, while the other half quit smoking using conventional smoking cessation methods. The conventional methods include counseling, behavioral support, motivational interviewing and recommendations to use smoking cessation medication and nicotine replacement therapy. Most of the participants were middle-aged, 47% of whom were women. They were asked to visit one of the clinical study centers six months after their target quit date, where data on their smoking cessation status and side effects were collected.

The ESTxENDS research group was funded by the Swiss National Science Foundation (SNSF), the Tobacco Prevention Fund (TPF), Swiss Cancer Research (SCR) and LungeZurich. The study is ongoing: It received further funding from the Swiss National Science Foundation in 2023 to extend the follow-up to five years, which is currently the longest follow-up period for studies on this topic worldwide. Following the initial results after six months, the results of the analyses of the participants' clinic visits after 12 and 24 months as well as the results of questionnaires and other examinations will be published later.

[Further information](#)

Study centers and funding sources involved in the ESTxENDS study:

Study management and coordination: Bern Institute of Family Medicine (BIHAM), University of Bern

Study centers:

- Bern: Department of General Internal Medicine, Inselspital, University Hospital Bern
- Geneva: Primary Care Division, Geneva University Hospitals (HUG)
- Lausanne: Unisanté, University Center for Primary Care and Public Health
- St. Gallen: Department of Pneumology and Sleep Medicine, Cantonal Hospital St. Gallen (KSSG)
- Zurich: Epidemiology, Biostatistics and Prevention Institute (EBMI), University of Zurich and Arud Center for Addiction Medicine

Other institutes:

- Study laboratory (toxicology): Unisanté, University Center for Primary Care and Public Health
- Study support : Clinical Trials Unit (CTU), University of Bern

Funding: Swiss National Science Foundation (SNSF), Tobacco Prevention Fund (TPF), Swiss Cancer Research (KFS) and LungeZürich

The Institute of Primary Health Care (BIHAM) of the University of Bern

The BIHAM is committed to training and promoting the next generation of GPs, researchers and teachers in primary care and related fields. It provides the academic foundations and requirements for evidence-based, safe, patient-centered, data-driven and sustainable healthcare at cantonal and national level. It conducts high-quality research in primary care and related areas, promotes cooperation at cantonal, national and international level for research, teaching and continuing education and is committed to avoiding waste of resources in research and teaching, among other things.

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