

# 電子菸可能會增加青少年的齲齒率

## E-cigarettes May Increase Rate of Caries in Youth

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吸電子菸正迅速成為吸傳統菸的流行替代品。最近一項名為「電子菸液中甜味香料的致齲性潛力」的研究探討了不同的電子菸香料如何影響患者的口腔健康。

### 吸電子菸的崛起

電子菸有各種別稱，包括「電子香菸」、「呼菸」和「筆菸」。電子菸裝置有許多形狀及顏色。消費者可以輕易地購買到類似 USB 隨身碟、筆或普通捲菸的電子菸。

每一裝置有三個主要部件：可充電鋰電池、電子菸液（或香料）及汽化室。當啟動時，鋰電池會加熱該香料並製造出使用者可以吸入到他們肺部的氣溶膠蒸氣。電子菸液通常包含各種的混合物，包括丙二醇、植物甘油、尼古丁及可以改變液體味道的其他類型香料。

第一支正式的電子菸是在 21 世紀初公開的。現在，差不多二十年後，電子菸已經取代捲菸成為兒童及年輕人最常用的菸草產品。根據最近的數據，在過去 30 天內使用

電子菸的高中生總數在 2018 年增加 75%。美國食品和藥物管理局報告指稱，18 歲以下使用者有 81% 表示他們更喜歡電子菸而非傳統菸，因為電子菸有各種各樣的風味。兒童和青少年也傾向於電子菸，因為電子菸容易使用且非常容易拆解，這在當他們試圖將裝置隱藏而不被教師及其他成年人看到時很有幫助。

雖然電子菸越來越受歡迎，但疾病控制中心警告說，電子菸可能對兒童、青少年及年輕人具有潛在危害，因為其含有尼古丁。尼古丁是一種高毒性且具成癮性的物質，此對青少年的大腦發育會產生負面影響。

除尼古丁外，一些電子菸液可能含有致癌物質及重金屬。同時，其他電子菸液的香料與「爆米花肺」及其他嚴重的肺部疾病具有關聯性。疾病控制中心還警告說，電子菸可能成為其他有害惡習的「入口」。

## 研究的結果

雖然許多科學家及衛生專業人員理解尼古丁相關的健康風險，但卻沒有進行過多次研究來確認呼菸或吸電子菸對患者口腔健康的影響。

發表在 PloS One 雜誌上的一項新研究發現，持續使用電子菸可能會增加患者未來罹患齲齒的機會。首席研究員 Jeffrey J. Kim，DDS 博士說他決定進行這項研究，因為他很好奇電子菸的氣溶膠會如何影響病患的牙齒。Kim 博士係在馬里蘭州的 Volpe 研究中心進行實驗，並獲得美國牙醫協會基金會的資助。

隨著時間的推移，研究人員系統地評估了電子菸氣溶膠，並發現某些類型的甜味電子菸液香料會透過促進變種鏈球菌生長及粘附到牙齒表面而增加病患發生齲齒的可能性。最終，Kim 博士發現電子菸的香料會與口腔發生反應，方式非常類似於糖果或高酸性飲料。

## 結論

該研究發現，電子菸會增加兒童、青少年及年輕人形成齲齒的機會。由於年輕人是使用電子菸增長最快的群體，這可能會對他們在成長期間的口腔健康產生負面影響。Kim 博士希望進行更多研究，以進一步研究吸電子菸對健康的影響及其對口腔健康的影響。同時，牙醫師應警告年輕患者避免受到吸電子菸的潛在風險。

# **E-cigarettes May Increase Rate of Caries in Youth**

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Vaping e-cigarettes are fast becoming a popular alternative to smoking traditional cigarettes. A recent study titled, “Cariogenic Potential of Sweet Flavors in Electronic-Cigarette Liquids,” examined how the different e-cigarette flavors may affect a patient’s oral health.

## **The Rise of Vaping E-cigarettes**

E-cigarettes have various nicknames, including “e-cigs,” “vapes” and “vape pens.” E-cigarette devices come in many shapes and colors. Consumers can easily buy e-cigarettes that resemble USB flash drives, pens or regular cigarettes.

Each device has three major components: a rechargeable lithium battery, e-liquid (or flavor), and a vaporizing chamber. When activated, the lithium battery heats the flavor and makes an aerosol vapor users can inhale into their lungs. E-liquids typically contain a various mixture of propylene glycol, vegetable glycerin, nicotine, and other types of flavors which can change how the liquid tastes.

The first official e-cigarette was released in the early 2000s. Now, almost twenty years later, ecigarettes have displaced cigarettes to become the most used tobacco product by children and young adults. According to recent data, the total number of high schoolers who used e-cigarettes in the past 30 days rose an estimated 75% in 2018. The US Food and Drug Administration reports that 81% of users under the age of 18 said they preferred to vape instead of smoke cigarettes due to the large variety of accessible flavors. Children and teenagers also gravitate towards ecigarettes because they are easy to use and very discrete, which is helpful when they’re trying to hide the device from teachers and other adults.

Although e-cigarettes are becoming more popular, The Center for Disease Control warns that ecigarettes may be potentially harmful to children, teens, and young adults because it contains nicotine. Nicotine is a highly toxic and addictive substance that can negatively impact the brain development of adolescents.

Besides nicotine, some e-liquids may contain cancer-causing substances and heavy metals. Meanwhile, other e-liquids have flavors that have been linked to “popcorn lung” and other serious lung diseases. The CDC also warns that e-cigarettes may be a “gateway” to other harmful vices.

## **The Results of the Study**

Many scientists and health professionals understand the health risks associated with nicotine, but not many studies have been conducted that examine the effects of vaping or smoking e-cigarettes on a patient’s oral health.

A new research study published in the journal PloS One discovered the continual use of ecigarettes might increase a patient’s chances of developing dental caries in the future. The lead researcher, Jeffrey J. Kim, DDS, Ph.D., said he decided to conduct the study because he was curious about how the aerosols from e-cigarettes

would affect a person's teeth. Dr. Kim performed the experiment at the Volpe Research Center in Maryland with a grant from the American Dental Association Foundation.

The researchers systematically evaluated e-cigarette aerosols over time and discovered certain types of sweet e-liquid flavors increased the likelihood of a patient developing caries by promoting the growth and adhesion of *Streptococcus mutans* to the surface of the tooth. Ultimately, Dr. Kim discovered that e-cigarette flavors reacted with the oral cavity in a manner very similar to candy or highly acidic drinks.

## **In Conclusion**

The study found that e-cigarettes can increase the chances of children, teenagers, and young adults forming dental caries. Since the youth is the fastest growing population to use e-cigarettes, this may negatively impact their oral health during their formative years. Dr. Kim would like to conduct more studies to further examine the health effects of vaping and its implications on oral health. Meanwhile, dental hygienists should warn younger patients against the potential risks of vaping.