

## EDITORIAL

# The safety and Long-term Health Effects of Using e-cigarettes

[*Chest Heart J.* 2019; 43(1) : 1-4]

DOI: <http://dx.doi.org/10.33316/chab.j.v42i1.2019592>

Electronic cigarettes are battery-operated devices used for a type of smoking called vaping. They produce a mist that is inhaled deep into the lungs, mimicking the feeling of smoking regular cigarettes. Like traditional cigarettes, most e-cigarettes contain nicotine. The exact amount varies by brand. Some have as much or more than paper cigarettes. They may also have added flavors and contain a variety of other chemicals.

Electronic cigarettes or e-cigarette or vape started growing popularity about a decade ago as a smokeless alternative to cigarette. E-cigarette works by using an electronic current to vaporize a fluid containing in most cases nicotine and flavorings. The general term vaping is commonly used to refer to the practice of inhaling such vaporized liquids through a wide range of electronic devices. E-cigarette was unregulated until 2016, when the FDA issued regulations that covered all tobacco products, including e-cigarettes. There is now over 800 vaping flavors on the market, most of which have not been evaluated for safety<sup>1</sup>.

E-cigarette was first discovered by a Chinese pharmacist Hon Lik in Beijing 2003 and quickly become popular healthier alternative for those who wanted the feelings of tobacco smoking. The first E-cigarette model is named “Ruyan”. There are three parts of E-cigarette – “Rechargeable battery” contain lithonium polymer that can be charge by USB. Battery has processor and micro switch. “Atomizer” – this is ultrasonic atomizer high frequency piezoelectric ultrasound emits heating element. A plastic “Cartridge” containing a solution. The whole device is called E-pen having different design and brand and the liquid in the cartridge contains nicotine solution and flavoring agents

called E-juice. These flavoring agents are refillable and having, strawberry, orange, lemon, mint etc. flavor<sup>2</sup>.

Activation of device has several steps, during inhalation airflow started and micro switch in the battery become On, by this switch, Atomizer become activated and there is connection between Atomizer and Cartridge. Atomizer heats up the liquid in the Cartridge until it turns into a mist. The mist may contain: nicotine, chemical flavorings, microscopic particles, volatile organic compounds (VOCs), heavy metals, such as lead, tin, and nickel. E-cigarettes can look like regular cigarettes, pipes, or cigars. E-cigarettes can also be used to inhale other drugs, such as marijuana.

The general consensus from the researcher that, those who wants to quit smoking they can be advice for using E cigarette or vaping<sup>3</sup>. According to medical science the different approved way of quit smoking is the primary means for targeted people, but if these fails then E cigarette is the useful option.

The approved way for quitting smoking is nicotine replacement therapy that means nicotine patch, chewing gum, lozenge or oral tablets. These can be try primarily as their efficacy have already proven but if these fails then vaping can be the option. About 12.2 % people worldwide smoke daily, they are mostly poor and chain smoker, it is impossible for them to buy nicotine replacement therapy because of cost<sup>4</sup>. They can be advised for vaping. The vaping can fulfill the requirement of nicotine and also the harmful effect of cigarette can be avoided. Some people are in favor of banning E-cigarette because they have minimum idea about

e-cigarette which also will hamper the effort of stop smoking campaign. What is the long term effect of vaping it is not yet certain but it is safer than formal burning cigarette no doubt because burning of paper cigarette produces 4000 harmful elements most of them are carcinogens<sup>5</sup>. Drawback of E-cigarette is that most of the consumers at present are young, they are using vape because of curiosity and also for giving up conventional cigarette

### **The risks of using e-cigarettes include**

E-cigarette or vaping product use-associated lung injury (EVALI): Worldwide 82% of individuals hospitalized with EVALI due to using tetrahydrocannabinol (THC)-containing products, and the additive vitamin E acetate has also been strongly linked to this outbreak, according to a study published in the Centers for Disease Control and Prevention (CDC) *Morbidity and Mortality Weekly Report*. Although other chemicals including flavoring agents may be responsible for injuries in some cases, the CDC recommends refraining from use of THC-containing vaping or e-cigarette products.<sup>6,7</sup>

Of the 2668 hospitalized EVALI cases as of January 2020, 66% were men, the median age was 24 years (range, 13-85 years), and 76% were younger than 35 years. Of the 2022 patients with available information on substance use, 82% (n=1650) reported using any THC-containing e-cigarette or vaping product, including 33% (n=669) who exclusively used THC-containing products. A total of 57% (n=1162) reported using any nicotine-containing product, including 14% (n=274) who exclusively used nicotine-containing product. Vitamin E acetate is used as an additive, most notably in THC-containing e-cigarette, or vaping. Vitamin E acetate usually does not cause harm when ingested as a vitamin supplement or applied to the skin. However, previous research suggests that when vitamin E acetate is inhaled, it may interfere with normal lung functioning. Additionally, a strong link has been found between vitamin E acetate and the EVALI outbreak, as the additive being detected in patient lung fluid sample

### **Nicotine addiction**

Nicotine is highly addictive, and most e-cigarettes include it as a main ingredient. Some e-cigarette

labels have claimed that their product had no nicotine when, in fact, it was in the vapor. For this reason, it's important to use only trusted brands if you vape. Originally, it was thought that vaping might be helpful for people trying to quit smoking. But, this early theory has not been proven. Some people who vape also continue to smoke regular cigarettes, despite a strong desire to quit.

### **Drug and alcohol addiction**

There are some reports that nicotine in e-cigarettes might prime the brain for addiction to other things, such as alcohol and cocaine. This is especially true for teens.<sup>8</sup>

**Lung disease-** E-cigarettes contain added flavors that young people enjoy. Some of these additives have health risks, such as diacetyl which has a buttery taste. Diacetyl has been found to cause a severe lung disease similar to bronchiolitis. Cinnamaldehyde, which tastes like cinnamon, is another popular vaping flavor that may be harmful to lung tissue.

**Cancer-** E-cigarettes contain many of the same cancer-causing chemicals that regular cigarettes do. Research published in 2017 found that the high temperatures needed to form the mist for vaping can create dozens of toxic chemicals, such as formaldehyde, which is thought to cause cancer.<sup>9</sup>  
**Explosions-** E-cigarettes have been known to spontaneously explode. This has caused injury. Vape explosions have been linked to faulty batteries in vaping devices. Though rare, vape explosions can be very dangerous and can cause severe injury. Commonly asked question that whether water can be used inspite of e juice the answer is no because of explosion by producing excessive heat.

**Regardless** of the ongoing investigation E-cigarette, or vaping, products should never be used by youths, young adults, or women who are pregnant. Adults who do not currently use tobacco products should not start using e-cigarette, or vaping, products. There is no safe tobacco product. All tobacco products, including e-cigarettes, carry a risk. THC use has been associated with a wide range of health effects, particularly with prolonged and frequent use. The best way to avoid potentially harmful effects is to not use THC-containing e-

cigarette or vaping products<sup>10</sup>. People with ongoing problematic marijuana use that causes significant impairment or distress should seek evidence-based treatment by a healthcare provider.

**Carbon monoxide & nicotine:** A dangerous duo

Carbon monoxide is a harmful gas inhaled when someone smokes. Once in the lungs, it's transferred to bloodstream. Carbon monoxide decreases the amount of oxygen that is carried in the red blood cells. It also increases the amount of cholesterol that is deposited into the inner lining of the arteries which, over time, can cause the arteries to harden. This leads to heart disease, artery disease and possibly heart attack.

Nicotine is a dangerous and highly addictive chemical. It can cause an increase in blood pressure, heart rate, flow of blood to the heart and a narrowing of the arteries. Nicotine may also contribute to the hardening of the arterial walls, which in turn, may lead to a heart attack. This chemical can stay in the body for six to eight hours depending on how often someone smokes. Also, as with most addictive substances, there are some side effects of withdrawal. Some e-cigarettes and newer tobacco products deliver even more nicotine than traditional cigarettes.

**The bottom line**

Cigarettes, e-cigarettes and tobacco products contain many dangerous toxins. The best thing should be is to quit tobacco entirely and not to spend the rest of life chained to a nicotine addiction. Thousands of people kick the habit every year, and you can be one of them. It may not be easy, but can do it.

E-cigarettes are still relatively new, so their long-term effects are not yet known. They may, however, pose multiple risks. In general, e-cigarettes are not safe for young people or for pregnant women. Vaping is not safer for developing fetuses than smoking traditional cigarettes. Vaping may have some benefit for smokers who switch it as a complete substitute for using other tobacco products.

Smoking is the most preventable cause of death worldwide. Almost one third of deaths from coronary heart disease are due to smoking and secondhand smoke. Smoking is linked to about 90%



of lung cancer cases. Smoking rates overall are down, but too many adults still smoke, vape and use other forms of tobacco especially between the ages of 21 and 34. About half of children ages 3-11 are exposed to secondhand smoke. On average, smokers die more than 10 years earlier than nonsmokers. You can be one of the millions of people who successfully quit every year.

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