

Studies Reveal Health Risks Of E-Cigarettes

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Photo credit: Michael Dorausch

“There’s no such thing as a safe cigarette.” This is a line that has been used to describe menthols, filtered cigarettes, and slims, but it also applies to the latest product for smokers: electronic cigarettes. They have been widely heralded by users and manufacturers as a completely harmless smoking alternative, but there isn’t much research to back up that statement. Recent studies have shown that they still contain tiny particles that can irritate lung tissue and could cause disease.

Modern electronic cigarettes have been available for a decade and have been booming in popularity. Unlike traditional cigarettes, e-cigs don’t burn dried tobacco leaves doused in nearly 600 additives; 69 of which are carcinogenic. Instead, a battery-powered device heats a liquid solution (called e-liquid) of nicotine and flavors, creating an aerosol that is inhaled to simulate the physical sensation of smoking in a process known as “vaping”.

Higher end models of e-cigs allow the user to adjust the voltage from the battery, which regulates the intensity of the heating element. As the solution gets hotter, it intensifies the effect of the nicotine hit. Unfortunately, these higher temperatures also affect the glycerin and propylene glycol used as solvents within the e-liquid, converting them to carbonyls found in cigarettes such as formaldehyde and acetaldehyde.

Earlier this year, a study found that increasing an e-cig’s voltage from 3.2V to 4.8V while using an e-liquid with both solvents produced almost as much formaldehyde as a traditional cigarette. While the human body produces formaldehyde as a byproduct of normal metabolic activity in the cells, it is suspected of being carcinogenic when inhaled. The same study also found that at lower voltages, e-cigs produced up to 800 times less formaldehyde than a cigarette. While this might sound a lot safer, the size of the vapor particles and the delivery method into the lungs heavily impact the risk of disease.

Particles found in inhaled cigarette smoke have a median size of 0.3-0.5 microns. Testing has found that the e-cigarette particles have a median of 0.18-0.27 microns. About 40% of these particles can travel deep into the lungs and become embedded in the alveoli, where gas exchange occurs. Even if the particle itself isn’t toxic, the size alone places a burden on the lungs and can cause disease.

As vaping is still fairly new, there just has not been enough time to do the necessary long-term studies regarding health risks. Though these early studies do hint that e-cigs are a better option than traditional smoking, that isn’t really saying a lot, because cigarettes are pretty terrible. Even if vaping is better than smoking, it doesn’t mean it’s safe. As its popularity continues to grow, it is important to understand the full risk associated with vaping for both the user and those exposed to the vapor secondhand.