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 Section OL10  
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### Part 1

Almeida-da-Silva, C., Matshik Dakafay, H., O'Brien, K., Montierth, D., Xiao, N., & Ojcius, D. M. (2020). Effects of electronic cigarette aerosol exposure on oral and systemic health. *Biomedical journal*, S2319-4170(20)30121-9. Advance online publication. <https://doi.org/10.1016/j.bj.2020.07.003>

Ebersole, J., Samburova, V., Son, Y., Cappelli, D., Demopoulos, C., Capurro, A., Pinto, A., Chrzan, B., Kingsley, K., Howard, K., Clark, N., & Khlystov, A. (2020). Harmful chemicals emitted from electronic cigarettes and potential deleterious effects in the oral cavity. *Tobacco induced diseases*, 18, 41. <https://doi.org/10.18332/tid/116988>

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### Part 2

#### Electronic Cigarettes

Despite its harmful effects on the human body, smoking is a ubiquitous habit that many individuals fall victim to each year. Giving rise to 6 million deaths annually, it has proven to be the leading preventable cause of illness and death by doubling the mortality rate of smokers in comparison to nonsmokers. According to module 11 of Patient Assessment Tutorials, “Smoking causes more deaths alone than AIDS, alcohol, accidents, suicides, homicides, fires, and drugs combined” (Gehrig, 2017, p. 344). This is because it is a risk factor for many systemic diseases such as cancer, periodontal disease, cardiopulmonary disease, obstructive pulmonary disease and cerebrovascular disease. A great majority of individuals that smoke are aware that they are putting their health at risk but the addictive nature of the nicotine embedded in the tobacco makes it difficult for successful cessation. Therefore it is important for health care professionals such as dental hygienists to bring awareness to the negative impacts that smoking can bring and encourage their patients to quit. On the other hand, it is also important for healthcare professionals to educate their patients about the other forms in which tobacco can be used because a lot of patients are unconsciously affecting their health by utilizing other tobacco products such as electronic cigarettes. No method of tobacco usage is safe because “all tobacco products emit over 7,000 chemicals, 70 of which have been identified as carcinogens” (Gehrig, 2017, p. 353).

Electronic cigarettes, or e-cigarettes for short, “are battery-powered devices that provide doses of nicotine and other additives to the user in an aerosol (Gehrig, 2017, p. 350). In our modern-day society, it is becoming more prevalent especially amongst adolescents, teens, and young adults in which the activity is often termed “vaping”. In some cases, it is even being used as a smoke cessation aid for individuals who either cannot stop smoking or are struggling to. The electronic cigarette is a handheld device often shaped like a flash drive that is prefilled with cartridges of a highly concentrated nicotine solution including vegetable glycerin, propylene

glycerine, and flavoring chemicals in a variety of appealing flavors such as tutti frutti, bubble gum, buttered popcorn, and etcetera. When heated, these contents can cause carcinogens such as heavy metals, formaldehyde, acetaldehyde, acrolein, and nitrosamines to be aerosolized increasing cancer risks in users and individuals passively exposed to them. According to the article, Harmful Chemicals Emitted from Electronic Cigarettes and Potential Deleterious Effects in the Oral Cavity, another substance found in electronic cigarettes is diacetyl “which destroys the airways in the lungs and can cause popcorn lung or bronchiolitis obliterans...The chemical vapors produced by vaping can alter or damage the epithelial cells, leading to oral ulcerations or oral cancer” (Ebersole, 2020). The heavy metals found in e-cigarettes also have the potential to cause chronic periodontitis, oral cancer, inflammation, and neurodegeneration. This makes “vaping” incredibly dangerous especially considering that these electronic cigarettes are not regulated by the U.S Food and Drug Administration (U.S FDA) so anything can be put into these cigarettes at the expense of the user's health.

As of right now, information regarding the impact that e-cigarettes have on the body is limited but there have been links to many conditions and diseases. Increased hospitalization among e-cigarette users found that there is a link between the product and injury of the lungs otherwise known as EVALI. According to the article, Effects of Electronic Cigarette Aerosol Exposure on Oral and Systemic Health, “symptoms associated with EVALI include chest pain, shortness of breath, fever, nausea, and vomiting...as of February 18, 2020, a total of 2,807 hospitalized cases or deaths were reported from all 50 states, the District of Columbia, Puerto Rico and U.S. Virgin Islands” (Almeida-da-Silva, 2020). It was later found that Vitamin E was also an additive in the cartridges of some e-cigarettes that led to strong inflammation of the lungs. According to the article, A Public Health Crisis: Electronic Cigarettes, Vape, and JUUL, “There is sufficient evidence that use of e-cigarettes can cause acute endothelial dysfunction, oxidative stress, symptoms of dependence, and an increase in heart rate and that chemicals in e-cigarettes can cause DNA damage and mutagenesis” (Walley, 2019) which further emphasizes the danger associated with e-cigarettes on the human body. Further-more, there have been some observations on the effect that e-cigarettes have on the oral cavity and in some cases there have been reports of hyposalivation, periodontal bone loss and development of fungal infections such as nicotinic stomatitis and hairy tongue due to the nicotine that's present in the e-cigarettes.

I chose this tobacco product because it is a relatively new innovation that is becoming more and more widespread. I have seen a lot of people my age use these products and there is a generalized belief that e-cigarettes are a healthy alternative to cigarette smoking. Being that it is becoming more common, I would need to know the risks associated with this product, if any, to be able to advise my patients correctly. It is important to provide smoking counseling to my patients during their dental hygiene visits because 30% of patients that present in dental offices are smokers and the main goal of our profession is prevention. Tobacco smoking has effects on the oral cavity that we as hygienists certainly would want to prevent so in order to do that we would have to address the underlying cause. Therefore, we have to try our best to steer our patients on the right path to avoid any health-related conditions. Tobacco smoking is the leading preventable cause of illness and death so it has been suggested as the 5th vital sign since it is a risk factor for many systemic conditions. Even if our patients are already aware we have to be able to encourage them to be healthier and make the best decisions for their health.

If I had a teenage patient that started smoking 2 months ago, I would advise them that they need to consider quitting because it has devastating effects on their health. I would alert

them that they are at a higher risk for periodontal disease, coronary heart disease, and cancers such as oral, lung, and pharyngeal cancers. My goal would be to invoke change because they have their whole lives ahead of them and I'm sure they wouldn't want to risk premature death or decrease their quality of life. I would conduct a head and neck examination as well as assess their oral condition and if anything presents that is linked to smoking, I would alert them of it to express concern and encourage them to quit. I would personally ask them how they feel about quitting to see how willing they are to make a change and then assist them with the process by offering resources such as quitlines and referring them as necessary. In the case of a 30-year-old adult who has been smoking for 12 years, I would do the same thing. The difference, however, is I would emphasize that it is never too late to quit. Individuals who have been smoking for a very long time would think that the damage is already done and that there is no point in quitting. However, I would share with them that within 2 weeks of cessation, lung function increases by up to 30%, and over time their risks for these systemic conditions will continue to decrease. This would show them that there is still hope although they have been doing it for so long.

Overall, Tobacco usage of any kind is problematic for the entire body. It can cause cardiovascular diseases, pulmonary diseases and a plethora of cancers. As dental hygienists, it is our responsibility to encourage our patients to quit and provide them with the resources to do so. There is a wide variety of tobacco products and there are often misconceptions that one is better than the other. In the case of e-cigarettes, it is seen as a healthier alternative because it has less chemicals than the traditional cigarette. However, it still has many toxicants such as heavy metals, formaldehyde, acrolein and etcetera. Even more concerning is the fact that it is not FDA regulated meaning that anything can be placed in it and pose a huge health risk to those using it. As a result, these products have links to respiratory illnesses, cancers, and periodontal diseases. It is therefore important to discuss these products with our patients so that they are educated on what they are using and can make better choices for their overall health.

### **Part 3**

From this assignment, I learned that no amount of smoking is healthy for the body. I used to think that electronic cigarettes or water pipes were not as problematic as cigarettes or cigars but in actuality, it is just as bad due to the amount of toxins that exist in the products. Thankfully, at this present time, I do not know any individuals that have used electronic cigarettes. However, when I was in high school I did witness a few instances in which they were being utilized by classmates. They were using it mainly to fit in with others and due to the innovative design of the product, they were further encouraged to use it because it made them seem cool. If I knew then what I know now, I would have encouraged them to stop using the product because it is just as impactful as traditional cigarettes. This assignment taught me just how climacteric quitting is in the fact that within 24 hours the risk of a heart attack decreases and within 15 years of cessation, that individual's risk of coronary disease and lung cancer is about the same as a person that never smoked. To me, that is a very surprising fact because I would expect them to have almost the same amount of risk as they did when they last smoked. It is also a great fact to keep in mind because it will allow me to more effectively encourage my patients to quit. Knowing that they have hope to change their lives around will influence them to make the change no matter how long they have been smoking.

This assignment was beneficial because it increased my awareness about the various types of tobacco products that are currently being used in our society. As a healthcare

professional, it is important to have at least a general understanding of what our patients are using and how it can affect not only their oral health but their health overall. We need to be able to give them helpful advice and the knowledge necessary to make the decisions that may be difficult for them to make on their own. In the case of tobacco products, nicotine is a naturally occurring addictive substance that exists in tobacco and it leads to dependence on the product. Therefore, a patient of ours may already know about all the harmful effects associated with the product that they are using but cannot easily quit as they would like to. Through this assignment, I was able to learn that cessation of tobacco products often takes multiple attempts and the more attempts taken leads to a better chance of permanent success. This is a piece of information I can share with my patients to let them know that what they are going through is normal and that they can get through it. I feel more comfortable with having conversations with future patients about cessation because I know how to do it effectively. At first, my concern was that I may be nagging the patient about something that they already know but now I know that patients actually appreciate the constant encouragement given by health professionals. I also learned about quitlines which “are toll-free telephone centers staffed by trained smoking cessation experts” (Gehrig, 2017, p. 361). I was not aware that there was a hotline for this but I am glad to have learned about it because it is an effective resource I can share with patients that need assistance with quitting.

## References:

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