

The Oral Manifestations of Tobacco Smoking on Dental Patients

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December 18th, 2016

“Tobacco is the only industry that produces products to make huge profits and at the same time damage the health and kill their consumers”—Margaret Chan

Nicotiana tabacum, the scientific name for tobacco, is one of the most cultivated and addictive plants in the world. Before it was introduced to the western world, tobacco was used by Native Americans for religious and medicinal practices. After his expedition to the New World, Christopher Columbus brought tobacco to Europe where it was popularized. The United States began to widely produce and commercialize tobacco during the American Revolution War, and its success helped fund the war. With incredible well-planned marketing strategies by tobacco companies, cigarette sales flourished in the United States. Eventually, the use of cigarettes increasingly grew during World War I, and sales sky rocketed during World War II. Despite the efforts of some scientists, the detrimental health effects of tobacco were not publicized until the

1960s. It was only in 1965 that the Federal Cigarette Labeling and Advertising Act was passed to ensure that warning labels are placed on all cigarette packagings.

Although the serious side effects of tobacco has become more apparent since its introduction, cigarette smoking is still a pandemic problem. Today, although the general public is well aware that cigarette smoking is extremely harmful, there is still 20% of Americans who are chronic smokers. The Centers for Disease Control and Prevention (CDC) defines cigarette smokers as those who currently smoke every day or some days, or who have at least had 100 cigarettes or more during their lifetime. The CDC reports a remarkable 480,000 deaths annually caused by cigarette smoking, making it the leading preventable cause of death in the United States. Considering the amount of public awareness of health risks associated with cigarette smoking available, these astounding statistics are appalling and suggest that although the number of cigarettes smokers have declined over the years, it is still a profound problem. In evidence, \$300 billion is spent in the United States to treat diseases related to cigarette smoking (2016). These numbers are significant, especially for a first world country with many information and resources available to its people.

On a global scale, tobacco is responsible for six million deaths each year, as reported by the World Health Organization (2016). In countries with disadvantages and less assistance, health problems associated with cigarette smoking are even more overwhelming. For example, in China, only 38% of its people are aware that cigarette smoking causes heart diseases (WHO). In addition, although tobacco cessation programs have proven to be effective, only 24 countries have these services available (2016). This suggests the importance and urgency of advocating and funding these programs to underprivileged, third world countries.

One of the most important roles of a successful dental hygienist is to prevent oral diseases in patients. In order to do so, it is important to be able to effectively educate patients on periodontal diseases and how it affects their oral and systemic health, since the etiology of the disease is not widely understood by the general public. Although cigarette smoking has decreased since its introduction, it is still a significant problem that exists worldwide. Numerous studies have made it evident that smoking increases the risk of death from many systemic diseases such as cancer, cardiovascular, and respiratory diseases. Most patients are aware of systemic diseases that are associated with cigarette smoking, but not many recognize the long term effects it specifically has on the oral cavity. In addition to “bad breath, stained teeth, and loss of taste and smell,” cigarette smoking has been correlated to periodontal diseases (ADHA).

The aim of my research is to understand the periodontium as it relates to periodontal diseases such as gingivitis and periodontitis, the etiology of the disease, the biological mechanisms that explains the correlation between the nicotine and periodontal diseases, treating periodontal diseases in patients who smoke, and the impact of smoking cessation programs. By the end of my research, I hope to be able to educate patients on the detrimental health effects of cigarette smoking and how it is a major risk factor for the development of periodontal disease. I hope to be able to choose the best treatment and therapy for the patient who smokes. In addition, I hope to be able to convince patients who smoke to commit to smoking cessation programs.

The periodontium consists of several important components, each exhibiting certain characteristics that constitutes a healthy oral cavity. One of the main component is the gingiva. In health, the gingiva in character is pink to red in color, firm in consistency, fits snugly between inter proximal spaces, and does not spontaneously bleed or display any exudate upon touch. The alveolar mucosa is the mucous membrane that lines the alveolar bone. The alveolar bone is the

structure that holds the teeth to the maxillae and the mandible. It is also known as, “the tooth socket”. Between the teeth and the alveolar bone is the cementum, a calcified substance that covers the root of the teeth and attaches it to the alveolar bone. It does so by anchoring itself to the periodontal ligament, the bundle of specialized connective tissue fibers that serves many functions including support, shock-absorber, remodeling cells, nerve function, and the deliverer of nutrients to cells due to its high vascularity. In health, these components work together in a symphony. Without the existence of one, efficiency and efficacy is reduced or lost (Wilkins & Wyche, 2013).

Periodontal diseases greatly affect the periodontium by disrupting the tissues and structures that supports it. The disease is induced by plaque, which with its existence over a period of time initiates an inflammatory response. In a diseased state, the gingiva appears bright red and bulbous compared to what is seen when in health. The appearance is in response to an increased in permeability of blood vessels and white blood cells migrating towards the infected site; the darkened color from increased blood flow, and the spongy consistency due to excess fluid. This is how the body reacts in order to fight off foreign materials. At this stage, the disease is better known as gingivitis. As the disease progresses, the gingival tissue surrounding the crown of the teeth is slowly destroyed. *When using a periodontal probe to measure pocket depth, 1-3mm is considered healthy, while anything above will start to reveal underlying tooth structure. When the disease reaches the underlying bone structure, it is in a more severe state known as periodontitis.* In periodontitis, all components of the periodontium are affected. Significant amount of cementum, alveolar bone, and periodontal ligament is lost. Without the existence of these key players, it is not possible for the teeth to anchor itself, resulting in unwanted exfoliation (Wilkins & Wyche, 2013).

Gingivitis and periodontitis are primarily induced by the existence of plaque. However, there are many factors that can increase an individual's risk of developing the disease or increase the rate of its progression. These risk factors include but are not limited to, inadequate oral hygiene, heredity, diabetes, age, lack of proper nutrition, and immunocompromised diseases such as HIV/AIDs. Over the last couple of decades, there has been an increased amount of studies conducted to seek out the relationship between cigarette smoking as a direct risk factor for periodontal disease. Although it is well known that cigarette smoking causes many systemic diseases associated with the lungs and heart, it is not apparent to the general public that cigarette smoking is a risk factor for periodontal diseases mainly due to the fact that most patients are asymptomatic. A study done by Obeid and Bercy in 2000, associates cigarette smoking to defects in neutrophil (white blood cells) function, impaired inflammatory and immune responses to periodontal pathogens, increased rate of periodontal diseases by increasing alveolar bone loss and attachment loss, and increased pocket formation. When compared to non smokers, smokers have a higher number of probing pocket depth of at least 5mm as well as a higher rate of root exposure and tooth mobility (Obeid, Bercy 2000).

The defects in periodontal structures are primarily in response to nicotine, the major and most deleterious component in cigarettes. It is a colorless, natural substance that turns brown once exposed to air. Nicotine works by depressing the autonomic nervous system and stimulating the central nervous system. In low doses, nicotine acts as an analgesic, while in high doses, can cause tremors and convulsions. It is quickly absorbed by the gingiva and can be released for an extended period of time after inhalation. Smoking shifts the micro flora to having a higher prevalence of sub gingival bacteria more often found with periodontitis. It is a significant contributor for periodontal diseases, affecting gingival blood flow, cytokine production, and

neutrophil and immune functions. Bleeding upon probing tends to not be a factor that exists in cigarette smokers. This is due to the fact that nicotine decreases the gingival flow by constricting the gingival capillaries. This prevents sufficient vascularization. In turn, the body is unable to send necessary components, especially the essential polymorphonuclear (PMN) leukocytes, to fight off pathogens and infections. In addition, nicotine has a high affinity for root surfaces, altering fibroblast attachment by decreasing collagen production, while simultaneously increasing its breakdown (Malhotra, Kapoor, Grover, & Kaushal, 2010). This also explains why smokers have a higher rate of bone loss and lower rate of bone healing. Due to the effects of nicotine exposure, treatment response to periodontal procedures is reduced. It is also important to note that the amount of bone lost due to the effects of smoking is irreversible.

“The purpose of life is not to be happy. It is to be useful, to be honorable, to be compassionate, to have it make some difference that you have lived and lived well.” —Ralph Waldo Emerson

“The best way to not feel hopeless is to get up and do something. Don’t wait for good things to happen to you. If you go out and make some good things happen, you will fill the world with hope, you will fill yourself with hope.” —Barack Obama

Many studies have found that cigarette smoking is proportionally related to periodontal disease occurrence. The risk for developing periodontal disease is higher in active smokers when compared to non smokers or smokers who have quit. To analyze the relationship between smoking rate and periodontal disease prevalence, Jan Bergstrom from the Department of Dental Medicine at Karolinska Institute studied the statistical trends of smoking related periodontal diseases in Sweden over the last 4 decades. In 1970 alone, periodontal disease manifested in 80%

of at least 61% and at most 94% of cigarette smokers. In comparison, 40 years later in 2010, as the number of cigarette smokers reduced, the percentage of periodontal disease related to smoking also decreased to 58%. To put these numbers in a by-person perspective, the reduction in percentage of periodontal disease in 1970 when compared to 2010 means that 300,000 cigarette smokers were afflicted with periodontal disease in 2010, rather than a predicted 800,000 if the reduction in cigarette smoking had not declined. In addition to her study within the Swedish population, Bergstrom also noted the significant benefits of smoking rate reductions in the United States. From 1955 to 2000, as smoking rates decreased, incidence of severe periodontal disease also decreased by 31%. Bergstrom's analysis not only shows the causal relationship between cigarette smoking and the manifestation of periodontal disease, but also the importance of having smoking cessation programs available to encourage smokers to quit in order to prevent the progression of disease and death (Bergstrom 2004).

It is imperative to recognize the benefits of quitting smoking immediately. A study done by Tomar and Asma suggests that quitting smoking can improve periodontal health. For example, the study found that smokers who had quit for two years were three times more likely than non smokers to exhibit periodontal diseases. Former smokers who had quit for more than 11 years have the same likelihood as non smokers to exhibit periodontal diseases. Clinically, alveolar bone level, probing depths, and prevalence of the bacteria *Porphyromonas gingivalis*, are higher in current smokers than in former or non smokers. With cessation, a decrease in probing depths, increase in clinical attachment levels, and reduction in amount of *Porphyromonas gingivitis* are seen in former and levels are similar to that of non smokers. When observing inter proximal alveolar bone levels, the study shows that current smokers have at least 1.71mm of bone loss, former smokers have 1.55 mm of bone loss, and non smokers have

1.45mm of bone loss (Tomar, Asma 2000). Once alveolar bone is lost, it cannot be regenerated. It is important to have healthy alveolar bone levels, because it is the structure that anchors the teeth in the oral cavity. Without substantial alveolar bone levels, teeth will fall out. By ceasing cigarette smoking, periodontal health can be improved and decrease the progression of the disease. The conclusion of Tomar and Asma's study further resonates the importance and benefits of smoking cessation education and programs. It is another reason for the advocacy of these programs especially in dental office settings by the oral health care team.

Smoking cessation plays an important role in improving periodontal health. It can help reduce all the deleterious effects caused by cigarette smoking. As proposed by Obeid and Bercy, smoking cessation even in the first weeks can be advantageous to gingival health by reducing attachment loss and by a year, can reach further normal characteristics. However, due to a number of restraints, smoking cessation is often times discouraging and even impossible for many patients. Due to a lack of education, resources, and economic constraints, many patients, especially those who live in underprivileged communities, fail to quit. Therefore, I believe it is important to advocate for the fundings of smoking cessation programs in underserved communities, require health professionals especially dentists to inform and educate patients on the destructive effects tobacco has on the periodontium, and require dentists to educate adolescent patients in order to prevent them from smoking into adulthood.

When you show deep empathy toward others, their defensive energy goes down, and positive energy replaces it. That's when you can get more creative in solving problems."— Stephen Covey

“Empathy is about standing in someone else’s shoes, feeling with his or her heart, seeing with his or her eyes. Not only is empathy hard to outsource and automate, but it makes the world a better place.”— Daniel H. Pink

Over the last few weeks, I have encountered a couple of patients who are persistent cigarette smokers. These patients are different in many ways, but they also share many commonalities that explains why they continue to smoke, despite understanding the detrimental health effects of tobacco. In addition, most of these patients are not aware that tobacco cessation programs are government funded and are available to them.

Ms. P. H was my first patient of the day during my rotations at Gouveneurs Hospital. Ms. P. H is a 29 year old African American female who came in for a prophylaxis in which she has not received for over three years. Ms. P. H had a lot of questions pertaining to oral hygiene.

Ms. P. H: “Why is it difficult to clean my tongue? Why are my gums stained? Do you have any recommendations on how I can whiten my teeth?”

Before I proceeded to answer her questions, I conducted a series of questions pertaining to her health history. There were no concerning health issues and she was honest about her drugs and alcohol usage. Ms. P. H drinks alcohol and smokes marijuana on occasions. She has been smoking tobacco cigarettes since she was 17 years old, going through approximately ten cigarettes per day. When I asked her whether or not she has thought about quitting, she responded with a shrug. I proceeded to give her an intra oral examination, having all her previous questions in mind. Just as she had described, Ms. P. H did indeed have a white coating on her tongue, pigmentation on her gums, and extrinsic staining on surfaces of the majority her teeth.

Before I began the prophylaxis, I sat Ms. P. H upwards to answer her questions and more importantly, educate her on the manifestations of tobacco on her oral health.

It is extremely important to remember to be empathetic when educating patients, because they tend to be less receptive when your tone is condescending, despite it being unintentional. As healthcare providers, we tend to forget that the general population are not well informed with the same type of knowledge that we are trained to learn.

Bebe: “Ms. P. H, the coating on your tongue is due to an accumulation of bacteria over time that is not properly cleanse. The pigmentation on your gums is a normal variation among people of color. There are over-the-counter products that you can use to bleach your teeth in order to remove the staining. I do notice that you have generalized inflammation around your gums. This is your body’s way of telling you that you are not brushing and flossing properly. A lot of people are not aware that they are not using the correct techniques so I will show you. I also want you to be aware that because you smoke on a regular basis, your body’s mechanism to fight off bacteria accumulation and infections is drastically reduced. It is a major reason why there is an adequate amount of white coating on your tongue, why your teeth are stained, and why it requires much more work to brush and floss. Ms. P. H, are you aware of the health effects of cigarette smoking?”

At this point, I noticed that Ms. P. H was engaged in our conversation and it seemed like she was concerned.

Ms. P.H: “Yes, I know it causes lung cancer”.

Bebe: "Yes, it can definitely put you at higher risk for lung cancer, but I also want you to be aware of the effects that it has on your oral cavity. Based on my findings Ms. P. H, you currently have moderate gingivitis and as seen on your x-rays, you have mild bone loss. With cigarette smoking, your gingivitis, which is inflammation of the gums due to accumulation of debris, will turn into periodontitis if you do not quit. Periodontitis occurs when gingivitis has progressed into its advanced stages and instead of only affecting your gums, it is now also affecting your bones. Once you start to lose more and more bone, your teeth will eventually fall out because it no longer has anything to support it. In addition, the smoke from tobacco decreases your bodies' ability to fight off infection. If you somehow get an infection, for example, I can see that you have an impacted wisdom tooth. That area is very prone to infections since it is difficult to clean. Because you are a smoker, it will be more difficult for your body to fight off the infection and it is very possible for it to spread elsewhere. Notice how close our mouth is to our brain. An infection spreading upwards is very likely. I don't want to scare you, but I do want you to know the reality of long term smoking. Have you thought about quitting?"

Ms. P. H paused for a split second, looking as though she needed some time to absorb all the information I just poured on her.

Ms. P. H: "No, not really. I have a full time job and a daughter to take care of. It relaxes me when I'm stressed. I don't have any health problems and I feel fine. I guess I have to quit eventually but just haven't thought about it."

Bebe: "I understand. The first step in quitting is to have the motivation to quit. I want to offer you all the information and resources available to help encourage you to quit, but the choice is really up to you."

Ms. P. H thanked me and asked me to give her more information.

Upon further discussion, I learned that Ms. P. H have not visited the dentist in over three years because she did not have insurance and was not able to afford regular visits. She is a single mother who works full time, did not complete high school, and is of lower socioeconomic status. She smokes because it relaxes her when she is stressed with work or her daughter. She also socially smokes when she is around her friends. None of her previous healthcare providers ever took the time to educate her on the effects of cigarette smoking; they only ask her whether or not she smokes and the conversation ends there. I directed her to an online website that finds available tobacco cessation programs based on location. Ms. P. H appeared interested until she noticed that these programs charged a fee. I proceeded to complete her prophylaxis and dismissed her. Since I will not be back at Gouveneurs Hospital after this semester, I was unable to reschedule her for a six month follow up. However, I gave Ms. P. H my business card and asked her to contact me if she has any further questions.

My second encounter with a cigarette smoking patient was in my regular clinic at NYU College of Dentistry. Ms. K. L is a 36 year old Latin American female who presented for periodontal maintenance. Unlike Ms. P. H who had gingivitis with mild bone loss, Ms. K. L is a periodontal patient who presents with moderate bone loss. It was my first time seeing Ms. K. L, because her previous dental hygiene student graduated and had passed her down to my care. After reviewing her medical history, I found that she has been a smoker for over 15 years, is diabetic, and is at high risk for caries. No other significant health concerns were noted. I asked

Ms. K. L if she has any questions regarding oral hygiene for me before we get started with the procedure. She shook her head, but I realized it may be due to her limited English. Upon giving her an intra oral examination, I noted that Ms. K. L had normal gingival appearance, low salivary flow, attrition on her incisal edges, and localized extrinsic staining on the lingual surfaces of her anterior teeth. She did not exhibit too much bleeding on periodontal probing, but her plaque and calculus level was over 60%. These clinical findings suggest that her oral hygiene is fair to poor, low salivary flow and extrinsic staining is most likely due to cigarette smoking, and the attrition on her incisor edges is due to clenching and grinding during her sleep. Although her plaque and calculus levels were significant, her gingiva appeared relatively normal. This was a very interesting observation, because the findings were opposite from Ms. P. H; Ms. P. H's gingiva was inflamed. However, normal gingival appearance with no inflammation, in addition to low salivary flow, is in agreement with studies on cigarette smoking and how it affects periodontal tissues. It has been studied and concluded that cigarette smoking decreases vascularity and salivary flow, thereby decreasing the body's ability to send white blood cells to areas to fight off infections. This illustrates why the gingiva is not inflamed and redder in appearance since it has lost its ability to fight off infections.

I proceeded to ask Ms. K. L if she has considered to quit cigarette smoking. She tried to explain to me that she had tried in the past, but her efforts did not work. However, she noted that she had cut down significantly. She said she used to smoke a pack a day, but nowadays a pack can last her up to several days. I asked her if she understands the health effects caused by long term cigarette smoking.

Ms. K. L: "Yes, I know I can get cancer. I tried to quit but nothing works for me. I tried chewing the Nicotine gum and the patch, but I still turn back to cigarettes."

I said to Ms. K. L that I understand her frustrations and asked her if she ever tried to enroll into a tobacco cessation program. She went on to explain to me that she grew up in the Colombia and those sort of things do not exist. Then, I went on to educate her on the detrimental effects of cigarette smoking on not only systemic health but also the oral health, the same way that I did for Ms. P. H. However, since she is a periodontal patient with moderate bone loss, I spent more time explaining to her what can happen to her teeth if her symptoms persists. I continued to inform her about tobacco cessation programs that are available locally. She seemed interested, and continually nodded. I am not sure whether she fully understood what I said, since our conversation was very limited due to her lack of English proficiency. We did not have a translator available in the clinic and students who spoke Spanish were busy attending to their patients. It is an unfortunate circumstance, because I sincerely wanted to point her in the right direction to help her understand why she should quit and how she can quit. I completed her periodontal maintenance, scheduled her for a 4-month recall, and dismissed her. I hope to revisit the topic at our next visit and see if she had made any progress. In addition, I plan to have a translator available and ready in order to make our session more effective.

Treating Ms. K. L was a good experience when trying to understand the different factors that explains why certain patients do not quit cigarette smoking. In Ms. K. L's case, her lack of English definitely plays a huge factor in her understanding the health effects of smoking. Although she has a basic understanding that smoking can cause cancer, I am certain that she is not aware of the effects that it has on periodontal tissues, including her own symptoms as a periodontal patient. Having said, I believe it is vital to have translators available in clinics such as those at NYU College of Dentistry, since we live in an extremely diverse area with many

patients whose preferred language is not English. In doing so, we can have a better chance at helping these patients, because I felt like my session with Ms. K. L was not 100% effective.

“Good health is not something we can buy. However, it can be an extremely valuable savings account.” — Anne Wilson Schaef

“The foundation of success in life is good health: that is the substratum fortune; it is also the basis of happiness. A person cannot accumulate a fortune very well when he is sick.” —P.T. Barnum

Mr. M. A, 54 years of age, presented to general clinic for a scaling and root planing procedure on the upper and lower left quadrants. In preparation, before seating him, I reviewed his medical and dental history. When compared to my previous tobacco smoking patients, Mr. M. A is more medically complexed. His medical history showed that he is hypertensive, has hepatitis C, consumed a significant amount of alcohol in the past prior to being diagnosed with liver disease, and is still currently smoking tobacco on a regular basis. Scaling and root planing, a procedure better known as “deep cleaning”, is required for patients whose periodontal pocket depths exceed what is normally seen in health. In these situations, the debridement exceeds to the roots of the teeth, rather than just the crown. Per insurance policy, each patient can only have two quadrants completed at each visit. Thus, Mr. M. A had his upper and lower right quadrants completed during his last visit which happened in May. He was scheduled to come back the following week to complete the remaining quadrants. However, he did not show and we were not able to re-schedule him until recently. In Mr. M. A’s case, his pocket depths ranged from 4-7mm, three of his teeth were mobile with furcation involvement, and radiographs showed that he

has moderate bone loss. These characteristics are not ideal for an individual at his age. It is important that as clinicians, we focus not only to treat his conditions every three months, but also educate him on the manifestations of oral systemic diseases related to poor oral hygiene. It is also vital to encourage him to cease tobacco smoking, especially because his immune response is already compromised with preexisting conditions.

I greeted Mr. M. A in the waiting area and walked him to our chair. He arrived fifteen minutes late, but seemed apologetic. His English was not perfect, but we were able to easily converse. I reviewed his medical history and to the best of his knowledge, nothing has changed. I proceeded to ask him about his alcohol, tobacco, and drug usage. He told me he no longer drinks, but still smokes “sometimes”. I asked him to clarify what he meant by “sometimes”.

Bebe: “Mr. M. A, would you mind telling me exactly how many cigarettes you would say you smoke each day?”

Mr. M.A: “It depends. Some days I smoke four or five, other days I smoke half a pack, but I haven’t finished a pack in a long time”.

I entered his response and continued to the physical exam. No significant findings were seen in the extra oral examination. However, his intra oral examination differed. Despite the fact that scaling and root planing was done on his right side, his entire mouth was consumed with a significant amount of plaque and calculus, and his tongue had a generous white coating. This is a clear indication that his oral hygiene is very poor and he has not been following the instructions given by his previous dental hygiene and dental students. I collected the data and gathered my thoughts.

As I proceeded to give oral hygiene instructions, I wanted to be sure not to sound condescending. Our conversation was as follows:

Bebe: Mr. M. A, fortunately, every thing on the exterior of your head and neck appears to be within normal limits. However, I did find quite a few things that are concerning on the inside of your mouth. Can you tell me a little bit about your daily oral hygiene regimen? How many times are you brushing and flossing and what techniques are you using? Here is a mirror and if you want, you can show me by using this toothbrush and I also have some floss handy.

Mr. M. A: Yea, I brush in the morning and at night. I floss when I have time. I also use the rinse that they gave me last time.

Bebe: I'm glad to hear that you are using the oral rinse. However, we will need to work together to improve your brushing and flossing, because you have a significant amount of plaque and calculus accumulation in all areas of your mouth. Plaque is the soft debris, and plaque when left untreated turns into the hard debris called calculus. They are basically food for bacteria and if we don't do a good job at getting rid of them they are going to continue to eat away your bones, which you already have loss a moderate amount. If this continues, I'm afraid to say that you are going to lose your teeth.

Mr. M. A: Okay, I will try to come in more often to get the cleaning.

Bebe: That will be great, but I also need you to work on it at home. You will have to brush at least once in the morning and once at night. But more importantly, you will have to floss

regularly. I know it is difficult to find the time, but let's try to at least floss once at night and once you get better at it you can try at least once after every meals. This will really help your oral hygiene.

Mr. M. A: Okay I will.

Bebe: Mr. M. A, have you considered to quit cigarette smoking altogether? I know you mentioned that you have reduced the amount that you smoke, but what about quitting in general? I ask because cigarette smoking not only affects your lungs and heart, but it also cause diseases of the mouth which in your case you already have periodontitis. Smoking can significantly reduce your body's ability to fight off infections and because you have such an adequate amount of debris, smoking will only make it worse. It may not seem important because you don't have any pain in your mouth now, but I can assure you that it is a progressive disease. Eventually, it will eat away all your bones, you will lose your teeth, and if you happen to have an infection, it may cause a lot of complications. In addition to this, dental work to get all that fixed is extremely expensive. I highly encourage you to do so but I know that it isn't easy.

Mr. M. A: Yea, you know I tried in the past. I tried the gums and the patch. It just didn't do it for me. And the vaporizer that I see people smoking nowadays, it just isn't the same.

Bebe: I completely understand. Quitting is not an easy task. Nicotine is highly addictive and it takes a lot of time and efforts to quit. Have you considered a tobacco cessation program?

Mr. M. A: No, what is that?

I continued to give Mr. M.A information pertaining to tobacco cessation programs and how he can go about entering one. He seemed interested and was not taken aback when I told him that there may be a small fee. Our conversation continued and I learned that his wife is also a cigarette smoker. He said that he would tell her about the program and see if they can work something out and go together. I was happy to see that he was interested, because to my surprise, he asked me more questions. By the end of our oral hygiene instructions, I realized that Mr. M.A was most concerned with the cost of dental work.

Mr. M.A: How much does it cost if you lose your teeth?

Bebe: It really depends Mr. M. A. If you need to get an extraction, it can cost up to \$200. After that, if you decide to get an implant placed, that can cost up to \$1200. You will also need a crown on top of that implant and that can cost up to \$650. Now if you have more than 1 missing teeth and require a bridge, that can cost up to \$650 per unit and you will probably need 3 units. Please also be aware that these costs are reduced pricing that the school offers. In private practice, it is significantly more expensive.

Throughout our entire visit, Mr. M.A seemed the most awake and interested during this part of our conversation. He clearly was not aware that dental work can cost so much. Because of this spark, I decided to open up his radiographs to show him his bone levels. I made it a point that he only has a couple of millimeters left before his teeth become loose and fall out. Although Mr. M. A was in shock, I was somewhat pleased that I finally got his undivided attention to the topic. He told me that he and his wife works nonstop at many different jobs and they struggle to provide for their three children. They had tried to quit cigarette smoking before but never followed through, since they were always stressed out and could not find the time to commit.

Bebe: Mr. M. A, I completely understand. Quitting is not an easy task, to say the least. It requires not only the motivation, but a team of health care providers to help you during the process. That is what the tobacco cessation program aims to achieve. They work to provide you with the right team and the right medications in order to assist you during the process. Please let me know if you have any questions regarding this and I will be more than happy to point you in the right direction.

Mr. M. A thanked me for the information and for my kindness. He promised me that he would talk to his wife about it, and they will let me know if they have questions. I told him that at our next appointment in three months, I hope that he and his wife will have already enrolled in a program. My conversation with Mr. M.A was quite interesting, because rather than being more worried about the detrimental health effects, he was definitely more concerned with the cost of dental work. In his eyes, money was the major risk factor. It made me realize that I should definitely discuss more about the finances of dentistry and how patients can prevent having to pay for unnecessary dental work that is preventative if they take initiative to take care of their oral and systemic health.

“Smoking is then seen as a personal tool used by the smoker to refine his behavior and reactions to the world at large. It is apparent that nicotine largely underpins those contributions through its role as a generator of central physiological arousal effects which express themselves as changes in human performance and psychological well-being.” — Rob Ferris

“Giving up smoking is the easiest thing in the world. I know because I’ve done it thousands of times.” —Mark Twain

I met patient J.S while attending my periodontal and implant rotations at the college. Unlike my previous tobacco using patients, J.S is a 32 year-old middle class Caucasian female who does administrative work for a prestigious bank. She presented for periodontal maintenance; a prophylaxis procedure performed every 3-4 months for patients with existing periodontal disease. There were no significant findings in her medical history. Her odontogram showed that she has a few missing teeth; the first premolar on the lower right arch, first molar on the lower left arch, and the second premolar on the upper left arch. She has generalized extrinsic staining on all lingual surfaces. There is also significant decay on the distal occlusal surfaces of her second molar on the left side. It is apparent that she has had plenty of dental restorative work done. It is not common for a healthy person at her age to have such characteristics. In addition, the distal pockets on her second molar on the lower left arch presents with deep 5mm pockets with signs of inflammation. The attending dentist asked me to perform the periodontal maintenance procedure, review oral hygiene instructions, encourage tobacco cessation enrollment, and apply an antibiotic into the deep pockets.

While I was setting up the room, I asked J.S if she has any oral hygiene questions that I can answer for her.

Bebe: J.S, do you have any questions regarding oral hygiene that I can answer for you? Any questions with brushing or flossing or any products that you would like to inquire about?

J.S: Not sure if I'm brushing and flossing correctly. Someone told me that I should be careful not to brush too hard. Is this true?

Bebe: Actually, yes. This is a common mistake, and I get this question all the time. A lot of us grew up thinking that we need to scrub as hard as we can in a horizontal direction. Though it may sound like the right thing to do, it actually is the reason why so many people have recession and sensitivity. Let me first take a look.

Although I already had a general idea of what her dentition looked like while examining her odontogram, radiographs and previous notes, I wanted to physically show her what was going on. I sat her down and handed her a mirror so that she can follow what I was saying.

Bebe: J.S, it does appear that you have several areas of recession related to what we had just discussed about brushing too hard. The correct way of brushing is to use a soft bristle brush, angling it 45 degrees towards your gums, and using just your thumb and index fingers, you want to brush it gently in a circular motion. A few seconds per area and gently swipe up or down towards your biting edges.

J.S: Wow, that is not what I have been doing.

Bebe: Yes, it is a common mistake but as long as you fix it now, it will prevent future wearing away of the enamel. J.S, I do notice that you have quite an adequate amount of hard debris between and under your gum line. Do you floss on a regular basis?

J.S: Yea I try to at night.

Bebe: I want to show you the correct way of flossing because you are at a higher risk to lose more bone and eventually your teeth if we don't use preventive measures. And because you are a tobacco user, it is harder for you to fight off infections, especially if you are not maintaining excellent oral hygiene.

I proceeded to demonstrate to J.S the correct way of using string flossing. I also recommended a few products to help aid her in her daily regimen. Since she seemed receptive and interested, I decided to ask her about her tobacco usage.

Bebe: J.S, if you don't mind me asking, how many cigarettes are you smoking a day?

J.S: I've cut down quite a bit. I'd say I'm smoking about half a pack a day.

Bebe: I see. I just wanted to give you a bit of information regarding tobacco usage and the effects that it has on the oral cavity. Your current infection on that back tooth is most likely due to not only inadequate oral hygiene, but also the smoking. Smoking significantly reduces your body's ability to fight off infections. To be frank, you are too young to be having this much of dental work already done and I see that Dr. Castano has treatment planned for more procedures. I'd like for you to keep your remaining teeth and we can work together to prevent you from losing them at such an early age. First, we will work on a new oral hygiene regimen that you can easily follow. More importantly, I highly encourage you to quit.

J.S: Yes, my teeth has been very problematic and I'm trying my best. I'm so busy with work that my health has not been my priority. I am trying to change that. I've discussed with Dr. Castano about the issues and I'm trying to absorb it without having an anxiety attack right now.

Bebe: I'm sorry to hear. I hope you know I'm not trying to scare you, but I really think we can take a lot of preventive measures and renew your entire mouth. After Dr. Castano performs all the suggested procedures and we maintain frequent visits it will definitely help a ton. Most importantly though, the tobacco must cease.

J.S: I understand. I'm just not sure if I have the time to commit to quitting. It gives me too much anxiety when I don't smoke.

Bebe: I completely understand. But the interesting this is, although going for that cigarette break relieves that stress momentarily, the nicotine from smoking is actually the culprit that directly causes your stress and anxiety.

J.S: You can tell me all the science and I appreciate your time, but I just don't know if its the right time right now for me to quit. I will consider it. I just need to get all this dental work done and out of the way.

By this moment, I can sense that J.S was getting a bit impatient with me lecturing. She was trying her best to be polite, but it was apparent that she wanted to get moving with the procedures. I did not want to further aggravate her, so I decided to halt our conversation at that point.

Bebe: I understand completely. Please be in touch with me if you have any questions regarding oral hygiene or if you become interested in quitting. I can help guide you in the right direction with all the information and resources that we have here at the school.

J.S: Thank you.

I handed her my business card and began the prophylaxis.

Of all my tobacco using patients, J.S was the only patient so far that was least interested in quitting. I was definitely disappointed in how our conversation ended. I was optimistic while reviewing oral hygiene instructions since she seemed very interested in learning how to brush and floss. Unfortunately, once we got to the topic of tobacco cessation, she appeared less receptive, annoyed, and eventually grew impatient. Compared to my previous tobacco using patients, J.S displayed more negative emotions. I asked myself, “Is she too prideful and does not like to be lectured? Or is it the effects of nicotine that aggravates her? What negative emotions do nicotine addicts face on a daily basis?”

I’ve been focusing a lot of my present research on the biological effects and oral manifestations that nicotine causes. However, I’ve neglected the psychological effects entirely. Since I felt as though I failed to help J.S because I was unable encourage her in a positive way, I decided to research on the psychological effects that nicotine has on the patient who attempts to quit. I also wanted to know whether tobacco cessation programs consider these effects when helping patients.

“Addiction is the only prison where the locks are on the inside.” — Unknown

“I like nicotine because it excites my brain and helps me work” —Umberto Eco

Nicotine is a highly addictive drug due to its ability to cause rewarding effects in the brain. In the brain's reward system, nicotine stimulates the release of dopamine, a neurotransmitter that is responsible for functions such as movement, motivation, reward, and addiction. Nearly all addictive drugs work by increasing dopamine in the pleasure and motivation pathways. Increasing the release of dopamine affects the smoker by improving vigilance, attention and cognition, memory, and attentiveness. In comparison, low dopamine levels can cause fatigue, lack of motivation, mood swings, inability to concentrate, inability to feel pleasure, and memory loss; all of which are common symptoms of depression.

The reason why smokers become addicted to nicotine can be explained by Ivan Pavlov's theory of classical conditioning, a type of learning that occurs by, "repeatedly pairing a motivationally significant stimulus with a particular signal that will result in a conditioned response when the signal is encountered". In his experience, after repeatedly pairing food (stimulus) with bell rings (signal), Pavlov discovered that his dogs would salivate (conditioned response) to the sound of a bell even in the absence of food. For smokers, due to the repeated increase of dopamine, cues such as the sight of a cigarette package, seeing another person smoke, or inhaling tobacco smoke can cause them to want to smoke. The strong association of a variety of cues present in the environment and the need to alleviate unpleasant effects caused by low dopamine levels explains why smokers find it extremely difficult to quit (2016).

A study performed at the Department of Psychology at the University of East London determined the relationship between cigarette smoking and stress levels. Anxiety and stress levels were measured at pre-smoking, post-smoking, and between cigarettes. The study concluded that feelings of anxiety and stress were significantly higher pre-smoking than post-smoking. However, moods were impaired between cigarettes. This dangerous mood cycle

provides a rationale as to why smokers become highly addicted to tobacco. Smokers tend to smoke in order to alleviate negative feelings such as fatigue and irritability. After receiving the jolt of dopamine surge from a cigarette, smokers are almost immediately relieved from the unpleasant responses. Once the effects wear off, smokers return to their state of hostility and feelings of tension. In order to cope with these unwanted feelings, smokers turn to cigarettes once again. The pattern repeats itself, explaining why nicotine is highly addictive and extremely difficult to quit (Parrott, 1995).

According to smokers, nicotine helps them cope with life's demands by enhancing their unpleasant moods. However, nicotine is not intended for this purpose and does not cure a person from these problems. It is a misconception that smokers tend to have. In reality, despite the sudden and short-lived mood and cognitive improvements after smoking, nicotine usage actually leads to deleterious moods and cognitive impairments. Another study was conducted at the University of East London a few years later to compare mood states and cognitive skills among cigarette smokers, deprived smokers, and non smokers. During the initial session, smokers and non smokers had significantly lower levels of stress, irritability, depression, poor concentration, and low pleasure when compared to deprived smokers. After a cigarette break, mood levels generally remained the same for all three groups. However, the deprived smokers had elevated levels of depression. When comparing the ability to perform cognitive tasks, smokers and deprived smokers had more problems than nonsmokers before and after a cigarette break. The researchers concluded that nicotine does not reduce stress and does not produce any significant psychobiological advantages. Further, "smoking doesn't make the smoker less irritable or vulnerable to annoyance," but rather, "the lack of smoking or insufficient nicotine makes the smoker more irritable," (Parrott & Garnham, 1998).

In order to discuss tobacco cessation with patients, it is important to recognize the reasons as to why people smoke and understand why it is difficult to quit. I realize now that understanding the psychological effects of nicotine can help me empathize with the patient more. Of the four tobacco using patients that I interviewed, three were generally receptive to my health education and advices regarding cessation. However, my last tobacco using patient, J.S, was less than pleased to listen to my lecture, despite my efforts of trying to not sound condescending and patronizing. Prior to my research regarding the psychological effects of nicotine, I assumed that J.S was simply a stubborn character who does not like to be told what to do. Now, I find myself asking more questions. Before our appointment, when was J.S's last cigarette break? Does J.S experience any mood swings such as anxiety or stress? What are the main reasons why she smokes? What environmental cues enable J.S to take cigarette breaks? These questions can be helpful when determining the right treatment and therapies for the smoking patient to aid them in quitting. Perhaps J.S would have responded better to my discussion if she just had a cigarette break not too long before our appointment. If J.S smokes in order to alleviate unpleasant moods and feelings, then discussing the possibility of quitting while she is having these feelings may not be ideal. If anything, it may have triggered a more significant negative response.

If I could go back to my interview with J.S with the knowledge that I have gained regarding the psychological effects of nicotine and the misconception that smokers have regarding its benefits, I believe I would be able to conduct a better discussion with a better response. I would start off by asking her when her last cigarette break was in order to gauge what her mood may be. If it were long ago that she last had a cigarette break, I would assume that she would be more irritable and impatient, and less likely to be receptive to our discussion regarding cessation. I would also educate her on the fact that nicotine actually does not "cure" negative

moods but instead causes more stress after repeated exposure. In addition, it also impairs cognitive abilities rather than providing long-term improvement to attention and cognition.

Although I am disappointed by the outcome of my interview with J.S regarding tobacco cessation, I am glad that there was a silver lining. I was unsuccessful at educating and encouraging J.S to quit cigarette smoking, but her response allowed me to conduct further research on the topic. The information I gathered will help me during my future interviews with patients and to also become a more knowledgeable and effective clinician and therapist. Further, I have expanded my research on this topic, adding a psychological factor into the equation. This will allow me to find more techniques and programs to help patients quit smoking. Rather than only utilizing tobacco cessation programs, what other methods can be implemented to help the tobacco using patient to quit?

“If you can't run, you crawl. If you can't crawl-- you find someone to carry you,”— Joss Whedon

“Mastery of impulse is all about self-discipline and choice. The mind is a powerful tool with which we have the ability to be in control of ourselves,”— Alaric Hutchinson

There are various ways to quit cigarette smoking. Currently, the most common ways to quit are: going cold turkey without outside help, behavioral therapy, nicotine replacement therapy, prescription medications, or a combination of these treatments. Regardless of the strategy that the patient prefers, the most important rule is to have the willpower to commit to the plan.

Interestingly, a large proportion of smokers who successfully quit did so by going cold turkey without outside assistance. According to the American Cancer Society, more than 80% of successful quitters did so on their own. Psychiatrists from Baylor College of Medicine conducted a study where they received personal letters from formerly severely dependent smokers explaining how and what techniques they used in order to successfully quit smoking. Sixty-two letters were analyzed by studying illustrative quotations written by the respondents. The results show that 46% of the respondents reported that motivation and will power were the keys to their success quoting, "Will power is the answer. I desire this more than anything in the world". Twenty-eight percent of respondents claimed that making it a challenge to self was how they were able to succeed. Another twenty-eight percent of respondents said they were able to quit by applying an alternative object or activity in place of cigarettes. For example, they bought a ton of sugarless gum and when they craved a cigarette, they chewed the gum instead. The study found more techniques that smokers created for themselves in order to successfully quit (Baer, Foreyt, & Wright, 1977). This study was very interesting because none of these smokers used any professional help. It is a powerful message because it speaks volume of the importance of self-motivation and willpower. Regardless of the method used, I also agree that having this mentality will determine whether one will be successful at quitting. After speaking to a couple of patients who are dependent on cigarettes, most of them lack the motivation to even want to begin to quit. Regardless of what I try to implement into their regime, my words will go in one ear and out the other if the patient does not have the motivation to begin cessation. Therefore, if a patient lacks the willpower, does behavioral therapy help them achieve it?

A form of behavioral therapy called Cognitive-Behavioral Therapy (CBT) works to help people quit tobacco smoking by changing thought processes and introducing new learning

behaviors. Studies have shown that when combined with other quitting methods, CBT can be very effective at achieving high and stable abstinence rates. There are many techniques involved and combined with CBT. Techniques are individualized and specific to the patient. CBT helps patient cope with environmental situations where avoiding a cigarette is difficult. It also helps the patient cope emotionally with mood changes associated with withdrawal symptoms. The patient is further educated about the quitting process and ways of identifying cues that trigger the urge to smoke. The patient is also trained to learn to be more motivated to quit which as mentioned, is a very important factor when attempting to quit. In addition, the patient is also offered social support by surrounding them with a social network that is supportive of their attempt to quit. In my opinion, I think it is important that CBT and other behavioral therapies are readily available to patients since not everyone has the level of self-drive and motivation required to quit. These therapies are certainly and especially useful to many patients who have less education, live in lower socioeconomic communities, or suffer from other mental illnesses such as depression or anxiety to help reinforce a positive outlook for quitting (2010).

The goal of nicotine replacement therapy is to replace nicotine from cigarettes in order to reduce the withdrawal symptoms. By reducing withdrawal symptoms that occurs when the body stops receiving routine doses of nicotine, the patient is more likely to resist the urge to continue to smoke. Nicotine replacement therapy comes in various forms such as transdermal patches, chewing gum, inhalers, tablets, and nasal sprays. A systemic review study was conducted in 2004 at Oxford University to determine the effectiveness of nicotine replacement therapy in various forms, and to determine whether the effect is influenced by additional advice and support that the patient may receive. The study consisted of 123 trials comparing nicotine replacement therapy and a placebo or a non nicotine therapy control group. It was concluded that all forms of

nicotine replacement therapy are effective at promoting smoking cessation and “increases the odds of quitting by approximately 1.5 to 2 fold”. In addition, the findings also suggest that the effectiveness of nicotine replacement therapy is independent of additional counseling and/or support that the patient may or may not have (Silagy, Lancaster, Stead, Mant, & Fowler, 2004). The results of this systemic review surprised me, because I have heard from different people that nicotine gum or patches has not worked for them. It also makes a strong case since it appears to work regardless of additional counseling, which in my opinion can be an essential part of cessation. It makes me wonder whether it is the product itself or the patient’s willpower that is inadequate. I will definitely recommend one or more forms of nicotine replacement therapy to my patients. However, I will make it an effort to ask additional questions in order to determine the underlying reason as to why it does not work for some patients.

There are plenty of prescription medications that are available to help patients quit smoking. Some of these have helped people cope with withdrawal symptoms. However, it is very important for the patient to discuss benefits, risks, and side effects with their physicians. In a society where we heavily medicate people with various diseases, it is not the first treatment option that I would personally recommend for my tobacco smoking patient. I would seek out all other available options before I advise my patient to commit to prescription medications. There are very serious possible complications that can occur in some patients when taking these drugs. For example, mood and behavior changes are seen in some patients taking these medications and if they do not stop immediately, fatal consequences may occur. Drugs aimed to relieve withdrawal symptoms have been associated with suicidal thoughts, suicidal attempts, depression, severe anxiety, panic attacks, insomnia, paranoia, and acting on dangerous impulses. Due to

these extreme side effects, I would only suggest patients to go on a recipe of drugs as a last resort.

Due to the ongoing controversy regarding over medicating patients in our highly dependent pharmaceutical society, there has been a trending shift towards alternative medicine and remedies to treat various illnesses and diseases. Acupuncture is one all-natural method that claims to relieve nicotine withdrawal symptoms such as irritability, jitters, and fatigue. According to a study published by the American Journal of Medicine, reports on clinical trials suggest that patients who receive acupuncture are three times more likely to not smoke for up to a year. A form of psychotherapy called, hypnotherapy, claims that it can help patients increase their motivation for quitting and changing their smoking habits by triggering their consciousness. A study conducted at the University of California, San Francisco concluded that the efficacy of hypnotherapy is comparable to conventional methods and was helpful for smokers who had a history of mental illnesses such as depression. The cognitive skill of meditation has helped people quit smoking by regulating their craving, coping with withdrawal symptoms, and ease their stress and negative emotions from smoking. A study done at Yale University School of Medicine found that 32% of 88 treatment seeking nicotine addicts stopped smoking their usually 20 cigarettes a day after receiving mindfulness training (Borrelli, 2013). The results of the studies from these prestigious educational institution is astounding to learn and I would definitely recommend any of these methods to my patients. However, because these treatments are relatively new, I believe there needs to be more studies and reviews with larger sample size in order prove its efficacy over a longer period of time. But since there are no extreme side effects thus far, I would consider recommending these methods as an adjunct to cessation treatments as opposed to prescription drugs.

“If a country is to be corruption free and become a nation of beautiful minds, I strongly feel there are three key societal members who can make a difference. They are the father, the mother and the teacher, ”— A. P. J. Abdul Kalam

“Where do the evils like corruption arise from? It comes from the never-ending greed. The fight for corruption-free ethical society will have to be fought against this greed and replace it with 'what can I give' spirit, ”— A. P. J. Abdul Kalam

Tobacco Abolition: Is It Impossible?

In an ideal world, tobacco manufacturing, marketing, sales, and usage would be completely banned and eradicated in a blink of an eye. Unfortunately, the issue remains more complicated and complex than what we hope for. Globally, countries have made an effort to control smoking in certain areas, but have not completely banned the production and sales of tobacco entirely. For example, most countries have prohibited in-door smoking in public areas and facilities but even so, entertainment and restaurants are exempted. There are even a hand full of countries that do not have any restrictions on smoking at all. The detrimental health effects of tobacco smoking has been known for a very long time, making it the world’s number one preventable cause of death. Having said, it is very unfortunate that countries have not made more efforts to completely ban tobacco.

Although it may not make sense to me as to why tobacco is still being sold globally, the reasoning behind it is not difficult to see. Tobacco companies are extremely powerful and have long controlled governments and exploited various institutions in order to stay relevant. Corrupt

and greedy politicians have made private deals with tobacco companies in order to bypass laws and regulations, enabling them to further corrupt and control the public's minds. For example, in 1986, the United States Navy aimed to turn itself into a smoke-free organization by the year 2000. However, efforts of congressmen who backed tobacco companies passed a law, "requiring all ships to sell cigarettes and allow smoking". Over a decade later, it was not until 2011 that the U.S Navy became smoke-free (Proctor, 2013).

To date, only a single country has completely abolished tobacco. First, in 2005, Bhutan became the first country to make it illegal to smoke in all public places. Then, in 2010, Bhutan became the first and only country in the world to prohibit the production, sales, and use of tobacco. The Tobacco Control Act of Bhutan was initiated because their government was concerned with the physical health and well being of their people, and recognized the harmful effects of tobacco consumption and second-hand exposure to tobacco smoke. The act states that no one shall smoke in public places such as, but no limited to commercial centers, recreation centers, institutions, and public transportation. The act also ceases the trade and commerce of tobacco products. No person is allowed to cultivate or harvest tobacco, manufacture, supply or distribute tobacco and its products, and sell and buy tobacco and its products. The advertisement of tobacco is also banned; it is illegal to advertise, promote, or sponsor tobacco and its products through any medium. Scenes in any media outlet depicting tobacco is also prohibited. The act allows the import of tobacco under very high taxation and regulations. Tobacco products imported for personal consumption may be approved by Bhutan's Tobacco Control Board after duties and taxes are paid and these products must be labeled with health warnings. In addition, the act also provides the people of Bhutan with effective educational and public awareness

programs on the health risks of tobacco consumption, promotion of tobacco cessation, and provide tobacco cessation programs in rehabilitation and health care facilities (2010).

It is unbelievable to learn that the Kingdom of Bhutan has successfully abolished tobacco altogether. Prior to my research, I was pessimistic regarding this matter. It has been decades since its introduction and despite its apparent danger to humanity, the existence of tobacco is still growing strong worldwide. There are many reasons to this, especially due to the powerful corrupting forces of tobacco companies having the ability to control government legislations and mainstream media. Because greed is the driving force that overpowers life, I believed that tobacco prohibition is only possible in an ideal, utopian world. However, if the Kingdom of Bhutan is able to implement such laws, why is the rest of world not following suit?

There are so many benefits that exist with the cessation of tobacco altogether. Abolishing cigarettes would diminish addiction and death rates, reduce healthcare cost related to effects of tobacco, and even reduce global carbon footprint. These are only the obvious benefits; humanity can further benefit from tobacco cessation in other ways such as increase productivity in the work place simply from not being dependent and reliant on a drug. So why are we not following Bhutan's footsteps in making nations tobacco-free? Some may say that it is only possible for Bhutan because their population, at about 740,000, is much smaller than the United States. However, single states can implement state laws prohibiting the sales of cigarettes. It is possible because 15 U.S states creates these laws from 1890 to 1927 (Proctor, 2013). The power exists and can exist in local communities and state governments. It is not weather it is possible or scalable. The solution obviously exists, but when will it be implemented? It lies within the willingness of our government to put our health and well-being at the top of their priority list,

rather than personal greed. It is with dismay to realize that this is not the trend that the world is following.

If I ruled the world, a debate would not even exist regarding whether tobacco should or should not be legal. First, I would cease all tobacco production and sales. Then, I would make it essential to place all dependent cigarette smokers in effective rehabilitation centers, free of charge. If they have families to support, I would issue fundings to provide basic life necessities such as food, transportation, and health care to those in need. I would also make sure that their employers allow an extended leave of absence all paid for, and I will fund the companies' shortcomings. I will implement the same legislations that the Kingdom of Bhutan issued in their Tobacco Control Act. However, I will not allow any import of tobacco for any reasons. Thus, taxation purposes would not even exist. In addition to tobacco, any future drugs that do not have medical use proposes and/or are highly addictive, will not be allowed to be cultivated, manufactured, and sold, in order to prevent another pandemic. Government officials who aid private companies unlawfully and unethically will be rightfully punished and incarcerated. The checks and balances of my country will be closely monitored to prevent any corruption and personal greed. If these ideas were realized, tobacco would cease to exist altogether and eventually become extinct. However, I understand that this is very idealistic and will probably not occur—at least not during my generation.

If complete prohibition of tobacco is not currently plausible, there should be stricter regulations on how it is manufactured. In the 19th century, tobacco smoke was rarely inhaled because it was too harsh due to its high alkaline pH. To make tobacco less harsh when smoked, the sugars in tobacco leaf is burnt, making it more acidic by lowering its pH. Though it became less harsh, it is actually more dangerous to the body, because it allows the lungs to draw in the

smoke easier. By regulating how cigarettes are manufactured, we can reduce the rate of lung cancer caused by inhaling low pH tobacco (Proctor, 2013). Further, the low acidity is a risk factor for periodontal diseases, explaining why cigarette smokers are more prone to developing caries, gingivitis, and periodontitis. There should be strict regulations that forces tobacco companies to only be allowed to produce cigarettes with smoke no lower than a pH of 8. This can also make it less favorable to the smoker, hence, quite possibly reducing the rate and quantity at which it is smoked. This can potentially reduce the rate of lung cancer significantly.

Prior to this research, I already recognized the bad effects of cigarette smoking and second hand smoking. However, I have gained so much more knowledge on different aspects regarding the addiction of nicotine, how the body responds to chronic cigarette smoking, how patients react and respond to cessation, how to treat patients who are addicted to nicotine, different methods to treat nicotine addiction, the history of tobacco including its production, sales, and manipulation, how the world is (and is not) dealing with tobacco addiction, and of course the heroic Kingdom of Bhutan's initiation in ceasing all tobacco related activities in order to create a better world for their people. Though it is unlikely that the rest of the world will follow the footsteps of Bhutan's Tobacco Control Act during my lifetime, I will still make an effort to spread the awareness by educating my patients (and my children) and providing them with all necessary resources and information on cessation based on the knowledge I have gained through this research journey.

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