Drug Use and its Psychological and Physiological Effects

Mary Bella Torosyan

Ask the plants of the earth, and they will teach you.
-Job 12:8

"Take care of your body, it's the only place you'll have to live," said a wise man by the name of Emanuel James Rohn. This may seem like something we all understand: we should eat healthy, exercise, get a good amount of sleep each night, etc. But the damaging effects of smoking can completely shut out all of the good habits one practices to keep themselves healthy. Individuals that smoke are aware of the risk that comes along with it— but do they know all of them? And oddly, wouldn't knowing some of the risk that comes with smoking make someone want to quit, or for a non-smoker, never want to smoke at all? The leading inspiration to conduct this research journey was during one hot summer night, I was at a barbecue, but really felt like I was sitting on a cloud of cigarette smoke. As frustrated as I was, I decided to take that frustration and put it into something more productive: making a change. I asked the most destructive smoker there, Andy Tocah, why he smokes if he knows how bad it is for his health. He replied, "honestly, I enjoy every single cigarette that I smoke. You have to actually want to stop smoking in order to quit, and honestly, I don't want to." I was just as puzzled as I was before I asked this question. I hoped for a more reassuring answer, like that he is really wants to quit, but instead of stopping there, I continued to ask more: how could he could enjoy doing something that is killing him—literally? He replied: "I just ignore that specific bad part and I just enjoy it." Fatmir tried to make sense of what he was saying by telling me that one day he was going to die—and the reason for his death should be at least due to something he actually approved and enjoyed doing. This is where I was exposed to a problem bigger than what I could ever imagine.

Health professionals can play a crucial role in detecting addition and can help the addicted patient not only know of the consequences that come with drug use, but help really understand them. Drug addiction must be understood in all forms, because everybody is different, and in order to give the most effective treatment, the health professional must be educated about all the theories that come with the psychology of addiction. Since every patient will have a different relationship with the drug they interact with, this paper will be analyzing the multiple nature of addictions not only in the United States, but also in Armenia. The reason for this addition is to show how different countries are effected by drugs—by understanding these effects, researchers, scientists, and health care professionals can all work together to create a plan that may implicate plans of prevention to stop any new risks from taking place in the designated

countries. To further broaden the understanding of addiction for the health professionals, case studies in different individuals with different addiction experiences will also be integrated in this research paper. Lastly, the inclusion of oral manifestations seen in drug-using patient's will also be mentioned in order to help patient's understand not only the psychological risks that come with smoking, but also physiological ones.

One of the most intimidating parts of the health care professionals job is counseling patient's on the dangers of smoking. I believe as a health care provider, it is my duty to help all of my patient's, smoker or non-smoker, understand risks. This way, not can one help educate patient's on the dangers of drug use, but I also become part of their journey to quitting. The steps required in asking patient's about their drug use can be daunting and uncomfortable for not only the health care provider, but also the patient. This paper will work to construct a method for the health care professional on how to approach patients and their drug-using habits, whether legal or illegal, in order to assure the best care for them. In addition to discussing how to approach patient, an analysis of what should be specifically stressed to the smoking patient—in this case about the damages to their teeth, oral tissues, their physiological health and psychological well-being, will also be mentioned. Also, the health-care professional will also be able to recommend and advise patients to seek help outside of the dental office— whether in treatment programs or with family and friends— to help support them during their time of change.

In a poem titled "Living in the Body" by Joyce Sutphen, there are many connections that can be made to smoking and physiological health. Sutphen begins the poem by writing: "body is something you need in order to stay on this planet and you only get one." What does this mean when we connect it to the use of drugs and how it effects oral health and the rest of our health? The simplicity of language in this poem is enough to be understood universally: we have one body and we need it to stay alive in order for us to stay on the planet—there is no other way to understand this simple yet deep sentence. For the health care professional, reading this sentence to anyone is to expose them to the reality of the situation—if they continue to use the drugs they use, they are destroying the only body that they have been given. There is no way to get another, and so what will happen when that body cannot be used effectively anymore? We must value the body we have been given, and if toxins are used and put into the body, what does that show about the values one holds on their health? "Body is a thing you have to carry from one day into the next," Sutphen continues, "always the same eyebrows over the same eyes in the same skin

when you look in the mirror, and the same creaky knee when you get up from the floor and the same wrist under the watchband. The changes you can make are small and costly—better to leave it as it is." Is this claim true? This is true for those who do not use any form of drugs, but for those who do, there is an alternative to this specific passage. As the drug user carry their bodies from one day into the next, their insides are going through more changes than just their eyebrows, eyes, skin, knees, and wrists. They are facing life threatening damages such as cancer, brain damage, severe oral health effects and more.

"Body is a thing that you have to leave eventually. You know that because you have seen others do it, others who were once like you, living inside their pile of bones and flesh, smiling at you, loving you, leaning in the doorway, talking to you for hours and then one day they are gone. No forwarding address," writes Sutphen. Drug use can cause an earlier death, and if this is so, why are people shortening their life spans because of it? Wouldn't these patient's want to live a longer and healthy life? The people they love will have to live without them earlier than they have to because of their choice to use drugs. There is no way to get back the years that have been taken away due to drug use, but if treated early enough, there can still be hope.

The value of hope is still strong and alive in some patient's— this is the driving factor that allows for them to believe they can quit. They hope to get better and hope for a longer and healthier life. But in order to do so, there must be a support system behind them: that of which consists of family, friends, and of course, the health care professional.

Another poem, "The Masks of Love," by Alden Nowlan, Nowlan is attempts to show the reader how love can blind us to even the most obvious things. Nowlan writes, "I come in from a walk with you and they ask me if it is raining." Before moving to the next sentence, we may think to ourselves, if he was outside and it was raining, he would definitely know—he could have been in a rush to get to a dry place, he could have been wet, or maybe even upset that it was raining (like most of us get when we have to be outside while it is raining.) Interestingly, the poem continues, "I didn't notice but I'll have to give them the right answer or they'll think I'm crazy." How could the character miss something so obvious? This is the reason the title of the poem is called "The Masks of Love," because love makes us blind. We do not see the obvious, or sometimes even bad things, because the alternative just feels so much better, like ignoring the fact that drugs can kill you, or that being in a toxic relationship is still considered a loving and healthy relationship. Sound familiar?

If we look through the lens of the eyes of a drug-user to analyze this poem, we can understand how drugs "blind" the patient. They continue to use drugs and can't, or choose to ignore, what is actually happening around them and inside of them. The people around them may be getting upset because they want them to quit, and their insides are slowly deteriorating from the use of drugs. But all they know is the good, satisfactory feeling it gives them. But how can I help my patient's and anyone I know understand that apart from the good feeling, there is something much more dangerous and threatening that they will come to face if they don't take action as soon as possible?

By analyzing these two poems, we can see how using everyday language can be helpful for me, and any health care professional, get on a more understanding and personal level with patient's. I think that being understanding and comforting with patient's is the best way for them to listen and know that someone is really trying to help them. Of all of the fear that many patient's hold with doctors, I think that having a patient's trust with sympathy, understanding, and a judgement free attitude is the start to a healthy road to recovery. Also, the start to this road to recovery will require much dedication by the learner in order to really come to an understanding of what is going on inside of the drug users body and mind. This task may seem intimidating to whoever decides to make a change with their drug-using patient's. Before I decided to take on the very task of writing this research paper, I was a very frustrated and judgmental individual towards those who smoked. But as I mentioned earlier, the road to recovery is hard, but the road to understanding unconditionally may be harder. Much reading and research must be done, but empathy must also be practiced by those who want to take up the task of helping a drug-user.

Substance abuse is a worldwide phenomenon and it is not something to be ignored, and it is important for health care professionals to have thorough knowledge and understanding on drugs, whether they are classified as legal or illegal. While it may be uncomfortable to confront patient's about their drug use habits, it could be the very thing that determines the fate of their lives. As important as oral hygiene is, it is equally important to take into account the health of the entire body. By doing so, we can help patient's by sharing our knowledge to help them understand the dangers of drug use and their harmful and damaging influences on general and oral health.

Drug use can also give rise to what is called "substance-induced disorders." According to DualDiagnosis.org, drugs like cocaine, cannabis, and hallucinogens can "cause mental health problems and, when paired with a pre-existing mental illness, can exacerbate the symptoms of such illnesses. Some drugs, when taken frequently for long periods of time, can actually manifest as psychotic symptoms indicative of schizophrenia and bipolar disorder, according to the Australian Government's National Drug Strategy." Here, we are shown that not only can drug use cause physical harm, but also psychological harm.

Come to me, all you who are weary and burdened, and I will give you rest.

-Matthew 11:28

As I mentioned, substance abuse is a worldwide phenomenon. As an Armenian, hearing about the rise of HIV rates in Armenia is shocking. Although the numbers are relatively low, there is not much action taking place in order to prevent the numbers from getting higher. By using the example of HIV in Armenia, we can see how illegal injection drug use can be irreversible when not seeking help soon enough. In the article titled "Meeting the Challenge of Injection Drug Use and HIV in Armenia," authors Karine M. Markosyan, Aramayis Kocharyan and Arthur Potosyan state that "official statistics show that the HIV epidemic in Armenia, as in other countries of the Former Soviet Union, is driven mostly by injection drug use (54.5% of all registered cases). In recent years, a significant increase in the number of cases of infection resulting from the injection of drugs has been observed. So far, all of the individuals infected via IDU in Armenia have been men, the majority of whom were living temporarily in the Russian Federation (Moscow, St. Petersburg, Irkoutsk, Surgut, and Rostov) and Ukraine (Odessa, Mariupol, and Kiev). Studies have demonstrated that when an HIV epidemic is driven by injection drug use, early intervention becomes critical: once HIV has been introduced into a local community of injection drug users, there is a possibility of extremely rapid spread." As mentioned earlier, by analyzing how different countries are effected by drugs while it is still early, there may be enough time to start a plan for prevention to stop the further spread of disease due to drugs. Also, research that is conducted in different counties can open our eyes to different damaging results that may not even be occurring in our own country.

When taking a look at other drugs that may not give rise to diseases such as HIV, there are psychological problems that can cause lifetime illness. Drugs such as cocaine, crack cocaine,

marijuana, LSD, heroin, methamphetamine, and ecstasy "cause interruptions in the absorption and release of brain chemicals like serotonin or dopamine," and therefore, "the internal structure and function of the brain changes as use continues," according to DualDiagnosis.org. If a healthcare professional intervenes soon enough, they may be able to help. Studies show that the schizophrenic-like effects that are the result of the changes the brain experiences from drug use will more or less subside after the drug wears off. However, states DualDiagnosis.org, "this is not true for all drug users as frequent and prolonged use can cause side effects that last up to years after use discontinues. Early symptoms of psychosis are gradual and progress as the individual ages and/or drug use continues. Aside from delusions and hallucinations, there may be little to no response to emotion, lack of motivation, becoming socially withdrawn, incoherency in thought and actions; disorganized speech and violent, erratic, and sometimes dangerous behavior."

Intervention with a patient who may show these symptoms is crucial, so as to help restrict their symptoms from accumulating and to help them seek treatment so that they can end their drug use. This is why it is so important to have a deep and thorough understanding of what substance abuse is and how it can be targeted. While writing about the psychological damages that come with drug use, the inclusion of the analysis of the psychology of addiction and how the psychological theories and models that attempt to explain addiction will also be included. This can be a stepping stone in what to expect with a recovering drug user and how to expose the patient to the best treatment.

"So smoking is the perfect way to commit suicide without actually dying. I smoke because its bad, it's really simple"

-Damien Hirst

As Damien Hirst says in his quote above, smoking is the perfect way to commit suicide without actually dying. My professor Julia Keefer mentioned once that: "value analysis is critical because you must ascertain whether patients are knowingly opting for a slow suicide, whether the pleasure of consumption is greater than other pleasures in their life, or whether they got addicted for social reasons and now they can't get out of the beehive." All smokers are aware of the risks that come with smoking—some decide to ignore it given the fact they love the feeling too much to live without, and others are just not mentally and physically capable enough to quit.

The development of this research paper began when wanting to help 29-year-old patient Adam Gevorkyan quit smoking. One day, after realizing how much money was being spent on buying cigarettes, how dependent he was beginning to feel, and how he was exposing second-hand smoke on his non-smoker fiancée, he asked for help on how he can stop smoking. In this research paper, I will be following five cigarette addicts in order to show cases of different smoking habits that can take place. As I do not know any drug users, besides that of cigarette smoking, I will be focusing mostly on nicotine addicts. The five people that I will follow throughout their smoking journeys will be my Adam Gevorkyan, Amelia Arakelian, Daniel Torossian who are both cigarette smokers as well, Andy Tocah, who smokes cigarettes and e-cigarettes, and lastly, and Anna Sargsyan, who was a previous smoker and has quit for 6 years now. The goal in this paper is not only to help Adam quit smoking, but to help all patient's struggling with a nicotine addiction to find hope through their journey to quitting and to spread knowledge about different ways to do so.

Do you not know that your bodies are temples of the Holy Spirit, who is in you, whom you have received from God? You are not your own; you were bought at a price. Therefore, honor God with your bodies.

-Corinthians 6:19-20

55-year old patient Amelia Arakelian and 52- year old patient Daniel Torossian are immigrants who came to the United States from Armenia in the summer of 1991. Both of them were also smokers in Armenia, and given this circumstance, I want to mention how smoking has changed socially and even chemically. Amelia and Daniel mention how smoking wasn't deemed as dangerous as it is today when they first started smoking. Something that Amelia and Daniel have in common with Adam is that they began smoking for social reasons. When asking about the societal view of drugs in Armenia, they mention that almost everyone smoked cigarettes. More men than women smoked, but due to the very same social reasons they began smoking for, so did many of the other Armenian men and women.

As previously mentioned, there is a rise in HIV rates in Armenia. Why I found this shocking was because it has come to surface since the fall of the Soviet Union. Amelia and Daniel had just left Armenia before the fall of the Soviet Union, and so they were just as shocked when hearing about the rise in the rates of HIV. HIV was practically non-existent in Armenia before 1992—I say practically non-existent because there is no evidence to support my

statement, since it could just have been ignored or not recorded. What does Armenia have in common with other countries with rising HIV rates? In an article titled, "People Who Inject Drugs and HIV/AIDS," it is stated that "blood transfer, through the sharing of drug taking equipment, carries a high risk of HIV transmission. Around 30% of global HIV infections outside of sub-Saharan Africa are caused by injecting drugs, and it accounts for an ever growing proportion of those living with HIV. In Russia, the country with the greatest HIV burden among people who inject drugs, 57% of new HIV infections in 2013 were among this group. Other forms of drug use carry a risk of HIV transmission, but people who inject drugs have the highest risk. It is estimated that there are 12.2 million people who inject drugs worldwide, and around 1.65 million (13.5%) of this population are thought to be living with HIV. Four countries account for 63% of all people who inject drugs - China, Pakistan, Russia and the United States of America (USA) - reflecting the seriousness of the HIV epidemic for people who inject drugs in these countries. HIV prevalence among people who inject drugs is highest in South-West Asia (29.3%) and Eastern and South-Eastern Europe (22.8%)."

Also, I previously stated how much more dangerous drugs such as cocaine, crack cocaine, marijuana, LSD, heroin, methamphetamine, and ecstasy are. This is due to the fact that it is seen to "cause interruptions in the absorption and release of brain chemicals like serotonin or dopamine," and therefore "the internal structure and function of the brain changes as use continues," according to DualDiagnosis.org. While focusing on the harms and consequences of smoking, there must be a focus on the specific patient who is being treated and the reasons behind their addiction. Not every patient will have the same treatment—therefore, I want to

focus on the personal reasons why people smoke, when they most feel the need to and how I, and any other health professional, can help them understand how they will be able to quit.

One of the most interesting questions is why people do drugs when they are aware of the risks. On a website that works as an online community for rehabs, called "Pro Talk," an article titled *"The Psychological Basis of Addiction,"* by Dr. Lance Dodes, Dodes writes of "a new way to understand the psychology of addiction," where "if we are going to effectively treat the basic nature of addiction, we need to know its psychology." Dodes states that "every addictive act is preceded by a feeling of overwhelming helplessness or powerlessness. The particular situations or feelings that produce this helplessness are different for different people. Addictive behavior reverses these underlying feeling of helplessness. The behavior is able to do this because taking an addictive action (or even deciding to take this action) is a way of doing something that the person expects will make him feel better, in an act that is completely in his own control. Hence, this action creates a sense of being empowered, of regaining control against helplessness. The reversal of helplessness is the psychological function of addiction."

Everything good that happens to you (O Man) is from God, everything bad that happens to you is from your own actions.

-Quran 4:79

Taking this information, each of my interviewee's were questioned by me to state when they feel the most need to smoke. Not surprisingly—after reading Dodes' new way of understanding the psychology of addiction—each responded that the time of need for a cigarette comes at a time in which they feel stressed out and need to think. They feel an overwhelming rush of nervousness during situations in which they feel "emotionally threatened" (this term used by my cousin who had quit smoking) and the cigarette seems to calm them down and put their minds to rest. This, in other words, can be seen as a form of "helplessness." I have witnessed the act of helplessness with Adam when there were no cigarettes at a time of "emotional threat." Adam seemed to become wired as he raided his apartment looking for a cigarette one evening after he came back home from a hard day at work, this during the first few days of his plan to quit smoking. As I sat back and listened to him explain his feelings during this experience, he ended his story by saying he very quickly became extremely agitated and went to buy a pack of cigarettes. This is what may seem to be defined to the non-smoker as "withdrawal symptoms."

Healthline.com published an article titled "What is Nicotine Withdrawal?" that first explains the way nicotine effects the brain when it is absorbed in the body, by: "boosting mood, reducing depression, reducing irritability, enhancing concentration and short-term memory, producing a sense of well-being, and reducing appetite. Nicotine can be as addictive as other drugs, including alcohol, cocaine, and morphine. Nicotine withdrawal makes it more difficult to quit…withdrawal is the set of distressing physical symptoms that occur when you stop using an addictive substance." But what happens when nicotine has stop being used by the smoker? "Symptoms will depend on [the] level of addiction. Factors such as how long tobacco [has been used] and how much tobacco [was used] on a daily basis will impact the severity of…symptoms. Symptoms of nicotine withdrawal include: intense cravings for nicotine, tingling in the hands and feet, sweating, nausea and intestinal cramping, headaches, coughing, sore throat, insomnia, difficulty concentrating, anxiety, irritability, depression, weight gain." These symptoms have been experienced not only by Adam, but also the four other interviewees. The most dominant symptoms by the patients were stated to be is headache, anxiety, and irritability.

"What we need in America is a cultural revolution to inspire and empower this generation and future generations to reject drugs, a revolution that will make it as unfashionable to smoke pot, snort coke, try crack, or get drunk as it is to smoke cigarettes."

-Joseph A. Califano, Jr.

The quote stated above speaks volumes—we can see that cigarette smoking has been a long problem in American history. We can come to better understand addicts when we dig deep into the brain of one—the neurochemistry of what goes on inside of the brain of an addict, and how physically it can look different.

In the chapter "What Is Addiction?" in the book *Alien Landscapes? Interpreting Disordered Minds* by Jonathan Glover, a light is shined on neurochemical systems how they become "highjacked" when exposed to drugs. When is a habit an addiction? Why is it so hard to give up alcohol, nicotine, heroin, ecstasy, and so on? If one were to look up what drug addiction is, they would be exposed to a definition that states: "drug addiction is a chronic, often relapsing brain disease that causes compulsive drug seeking and use, despite harmful consequences to the drug addict and those around them. Drug addiction is a brain disease because the abuse of drugs leads to changes in the structure and function of the brain," (WebMD).

Glover states: “there is evidence that addictive drugs mimic neurotransmitters. Different addictions involve different kinds of neurochemical disruption, but the dopamine system is often involved. Release of dopamine at the relevant sites in the brain used to be thought of as the chemical correlate of pleasure. But when monkeys have been trained to recognize a signal that apple juice will soon come, the relevant dopamine neurons fire as soon as the signal comes. The dopamine system seems to be part of a more complex process of learning to seek and repeat pleasure,” (Glover, 276).

But how does the role of a normal neurotransmitter change when exposed to drugs? Glover continues to write: “in one route into addiction, drugs mimic ‘natural’ anticipatory signals of pleasure by releasing dopamine directly at the key points in the brain. “The high levels of dopamine release may trump conflicting signals. In this way, addictive drugs hijack ordinary systems of motivation and learning. The hijacking metaphor has been criticized for implying that addicts are compelled to act in a way that allows no possibility of choice. In the addict with the hijacked dopamine system, it may be exceptionally hard, but still possible, to override the anticipatory acceptance. Or it may be literally irresistible. There may be no sharp boundary between the two, only a difference of degree. But in responding to addiction, the distinction matters,” (Glover, 276).

In an article from The National Institute on Drug Abuse, it is also stated that “many people do not understand why or how other people become addicted to drugs,” and that “it is often mistakenly assumed that drug abusers lack moral principles or willpower and that they could stop using drugs simply by choosing to change their behavior,” (NIDA). What we have come to understand thus far in my paper, is that drug addiction is a complex disease and that quitting takes much more than just dropping whatever drug is in the hands of the addict and walking away from it. If quitting is not easy, then prevention and treatment may not be so easy either. But in order to have the most effective treatments and prevention methods, there must be a deep understanding of what addiction is and how it effects an individual. When we get to know more about how drugs work in the brain and throughout the rest of the body, successful treatments can take place anywhere in order to help addicts stop abusing drugs, lead a healthier life, and not be tied down to the addictive habits that made their lives unproductive, distracted, and dangerous.

The National Institute of Drug Addiction continues to give us an understanding of drug abuse by telling us about what takes place in the brain when drugs are involved. As I have already mentioned, drugs contain chemicals that "tap into the brains communication system and disrupt the way nerve cells normally send, receive, and process information." In which way do drugs cause this disruption? This disruption could happen in at least two ways, "by imitating the brain's natural chemical messengers," or "by overstimulating the "reward circuit" of the brain," (NIDA).

Why do some people become addicted to drugs while others do not? Almost everyone I know smokes cigarettes, and I have been told that it is surprising that I don't. People like myself who don't smoke work hard to maintain a very healthy lifestyle: good physical health, including diet and exercise habits, as well as mental health and well-being, which includes stress levels, time management skills, and productivity, are all aspects of a healthy lifestyle that I, and other non-smokers, take very seriously. For those who take care of their mind and body, it is considered unacceptable to smoke cigarettes or any other drug, for that matter. But could it be logical to believe that all people who do use and abuse drugs do not care for their physical or mental well-being? It may seem easy to come to this conclusion, but fortunately, there is a much deeper explanation of why people do drugs and their choices to continue doing so: like the aspects of society and personality that could allow for a susceptibility of becoming a drug addict.

"For a beginner, smoking a cigarette is a symbolic act conveying messages such as, in the words of the tobacco company Philip Morris, 'I am no longer my mother's child,' and 'I am tough.'"

-Martin J Jarvis

It was in the 1964's surgeon general's report where smoking was identified as a habit, rather than what we now know it to be as an addiction, due to nicotine. Not too long after, in 1988, Surgeon General C. Everett Koop was the first to argue "that Americans should be as outraged by nicotine addiction outcomes, (which he defined as mortality from smoking-related diseases) as they were by the epidemic of illegal drug use…But on some level it was hard to compare nicotine addiction to dependence on other drugs since nicotine dependence did not have legal consequences. Instead, the report focused on withdrawal symptoms, tolerance, and the inability of a user to quit despite the health risks." (Jarvis, 82). But does the result of no legal consequences taking place make nicotine dependence any less dangerous than other drugs, such as heroin or cocaine? The 1988 report explicitly stated, "the pharmacologic and behavioral

processes that determine tobacco addiction are similar to those that determine addiction to drugs such as heroin and cocaine." With this statement, a much bigger and alarming question arises: how can tobacco addiction and cocaine and heroin addiction be complementary to one another while one is considered legal and the other illegal? In which way are the chemistries of addictive drugs similar to one another? How do we consider what is legal and illegal?

In *Neurobiology of Nicotine Dependence,* Athina Markou states that "nicotine dependence is more prevalent than dependence of any other substance," where "nicotine is one of the main psychoactive ingredients in tobacco that contributes to the harmful tobacco smoking habit," and that glutamate, GABA (y-aminobutyric acid) and cholinergic transmission in limbic and frontal brain sites are critically involved in nicotine dependence," (Markou 1). To further understand when smoking changes from becoming a habit to an addiction, we must analyze how the neurotransmitters are distributed into the brain and what the effects are physically. "Nicotine," states Jarvis, "activates nicotinic acetylcholine receptors (nAchRs), which are widely distributed in the brain, and induces the release of dopamine in the nucleus accumbens. This effect is the same as that produced by other drugs of misuse (such as amphetamines and cocaine) and is thought to be a critical feature of brain addiction mechanisms." (Jarvis 278). This is where we see the intake of nicotine becomes similar to the effects of the intake of other, illegal substances: and that is due to the activation of a specific receptor in the brain.

Because nicotine is a psychomotor stimulant, "in new users it speeds simple reaction time and improves performance on tasks of sustained attention. However, tolerance to many of these effects soon develops, and chronic users probably do not continue to obtain absolute improvements in performance, cognitive processing, or mood," (Jarvis, 279).

Adam states that he needs to smoke a cigarette in order to calm down in stressful situations, typically during work. He also cannot drink coffee without having a cigarette. The coupling of these two habits has become something that nobody can come between. But according to Jarvis, "smokers typically report that cigarettes calm them down when they are stressed and help them to concentrate and work more effectively, but little evidence exists that nicotine provides effective self-medication for adverse mood states or for coping with stress," (Jarvis, 278). I continued to witnessed this while Adam made himself determined to quit smoking over and over again. He would get cranky, hungry more often, and couldn't sit in one

place. It was at this point when I began to believe that he must have picked up a cigarette at one stressful point in his life and realized the calming effects of it that kept him hooked. I was wrong—that wasn't how he picked up smoking—and as I continued to do research, I realized that Adam is wrong for thinking that cigarettes actually calm him down. Jarvis writes, "a plausible explanation for why smokers perceive cigarettes to be calming may come from a consideration of the effects of nicotine withdrawal. Smokers start to experience impairment of mood and performance within hours of their last cigarette, and certainly overnight. These effects are completely alleviated by smoking a cigarette. Smokers go through this process thousands of times over the course of their smoking career, and this may lead them to identify cigarettes as effective self-medication, even if the effect is a negative one."

"We are what we repeatedly do. Excellence, then, is not an act, but a habit."

-Aristotle

The word 'habit' is defined as: "a settled or regular tendency or practice, especially one that is hard to give up." The patient's that have been mentioned throughout this research paper, Adam, Amelia, Daniel, Fatmir, and Anna, all have picked up the habit of smoking, have either wanted to stop or continue to smoke, regardless of the harms. So when we say smoking is a "bad habit" what do we really mean when label it as 'bad?' What makes one habit good, and the other bad? And lastly, what makes one habit harder to give up than another?

PsychologyToday helps one understand what habit formation is by explaining that it: "is the process by which new behaviors become automatic. If you instinctively reach for a cigarette the moment you wake up in the morning, you have a habit. By the same token, if you feel inclined to lace up your running shoes and hit the streets as soon as you get home, you've acquired a habit. Old habits are hard to break and new habits are hard to form. That's because the behavioral patterns we repeat most often are literally etched into our neural pathways. The good news is that, through repetition, it's possible to form—and maintain—new habits."

In the article *Psychology of Habit* by Wendy Wood and Dennis Runger, it is shown that "a variety of cues might trigger habit performance, including aspects of physical environments, other people, and preceding actions in a sequence. Once habits form, perception of the relevant context cues automatically activates the mental representation of the habitual response." Exposure to cues, such as coffee, to patient's Adam, Amelia, and Daniel all activate their

smoking habit, therefore, these patients who associate coffee with cigarettes do not remember the taste of coffee without smoking a cigarette with it. In fact, Adam refuses to drink coffee unless he can smoke while drinking it. Thus, Wood and Runger's assumption "that the memory representation of a habit response is cognitively richer than a mere motor program that controls response execution," is valid. Given that human cognition is based on integrated sensorimotor units (Hommel 2009), "a habitual response will be represented in terms of response features as well as perceptual features. Specifically, the sensory feedback while making a response, which gives rise to the experience of performing the action, is included in the mental representation. As a consequence, a habit cue not only triggers a motor program, it also activates a multimodal representation, or thought, of the habitual response."

Given that everyday habits develop as people go about pursuing life goals, "habit formation is closely intertwined with goal pursuit. Nonetheless, an implication of the basic context-response mechanism underlying habits is that behavior becomes less responsive to current goals and planning as habit associations strengthen. Habits develop through instrumental learning and build on the fundamental principle that rewarded responses are repeated," (Thorndike 1898). A good example is when one repeatedly pursues a goal such as making a perfect cup of coffee. A study done by Wood and Runger showed that "people experience covariations between context cues (e.g., coffee filter) and actions (e.g., measure grounds) that lead to goal attainment." Daily life is full of such repetition. But what goal is being pursued by the habit of smoking? Is a bad habit one considered to be a habit with no, or even a negative, goal pursued?

"From a habit perspective," says Barry Everitt, in his article *Neural and Psychological Mechanisms Underlying Compulsive Drug Seeking Habits and Drug Memories—Indications for Novel Treatments of Addiction*, "the path to drug addiction involves not a pathological motivation for drugs but rather a shift from goal-directed to habitual drug seeking and consumption…initial drug seeking is voluntary and reflects the hedonic value of the drug. Through instrumental learning with drug rewards, context cues rapidly become associated with drug use," (Everitt 2014, Hogarth et al. 2013). Thus, drug use promotes habit formation in part by impairing goal-directed control.

Redish, Jensen and Johnson explain in their article titled *A Unified Framework for Addiction: Vulnerabilities in the Decision Process*, that: "in general, goal-directed impairments increasingly narrow addicts' behavioral repertoires onto drug habits by restricting their capacity for intentionally selecting alternative actions. Drug use also promotes habit responding through neurobiological processes that sensitize users to the incentive properties of drugs. Drug rewards appear to engage habits more rapidly than other reinforcers. Stimulants in particular accelerate and consolidate the development of drug use habits, speeding the neural shifts from associative to sensorimotor areas typically found with habit formation. The accelerated formation of habits hastens the transition from initial or occasional user to addict. In summary, drug exposure hijacks the habit learning system by exerting a continuous pressure in favor of habitual, context-driven behavior and away from the evaluation of the outcomes of action. As a result of these habitual and deliberative processes, drug use escalates so that people ultimately seek drugs compulsively. (Redish, Jensen, Johnson. 2008). The "hijacking" of the habit learning system and the escalation of seeking drugs compulsively due to drug use can be seen through the acts of withdrawal symptoms. A case of withdrawal symptoms can be seen with patient's Adam and Amelia, where both show much agitation and frustration when trying to lessen their daily amounts of smoking, or in other words, trying to reestablish their learning system when it comes to drug use.

When Jesus saw him lying there and learned that he had been in this condition for a long time, he asked him, "Do you want to get well?"

-Job 17:15

On another evening, I attended a gathering, with the same group of people, that I first mentioned in the beginning of this research paper. This time, a few newcomers were present, unfortunately they were additional smokers. This time I was surrounded in four directions of people smoking, when I realized that I was the only person who was a non-smoker. At this point, not only was I frustrated, but I was physically felt terrible. My stomach was cramping, I was lightheaded and my eyes were tearing. Next to Adam's uncles house, there is an apartment who smokes marijuana 24-7. Adam states that the smell of marijuana and air freshener circles their apartment. The moral aspect of smoking is something that effects the lives of smokers and even non-smokers. If smokers are knowingly put themselves at risk, what about when it comes to the public—why should everyone have to pay the price of smoking when not all of us choose to smoke? Professor Julia Keefer brings up a very valid point: "…as I barge my way through

midtown in 95-degree pollution, dodging smokers on every block, I am extremely angry about the air that I must breathe because of them. They have the freedom to destroy themselves, but they should not have the freedom to kill me when I am just going to work." As for myself, I am almost constantly surrounded by second hand smoke—whether outside or inside, with my own group of friends, or the outside public. What is the solution when it comes to second-hand smoke?

Like second hand smoke, the leakage of emotions can make a bystander an innocent casualty of someone else's toxic state."

-David Goleman

Although the belief of cigarettes holding a calming effect is the most popular belief with my interviewee's, it is not the only one. The belief that if everyone smokes, then nothing can possibly happen to them, is just as interesting of a belief. What about the innocent bystanders? Do smokers really believe that secondhand smoke is not something to be concerned about? According to the article *Second-hand Smoke, Cotinine Levels, and Risk of Circulatory Mortality in a Large Cohort Study of Never-Smokers*, research shows that second-hand smoke or passive smoke is defined as: "the involuntary inhalation of cigarette smoke from lit cigarettes and the exhaled mainstream from smokers." Also, it is stated that: "second-hand smoke has been recognized as a risk factor for lung cancer in nonsmokers and classified as a Group I carcinogen by the International Agency for Research on Cancer. Exposure to second-hand smoke has been shown to be associated with increased cardiovascular mortality in several, but not all, epidemiologic studies," (Gallo, Neasham, Airoldi, Ferrari, Jenab, Boffetta, Overvad, Tjønneland, Clavel-Chapelon, Boeing, Pala, Palli, Panico, Tumino, Arriola, Lund, Bueno-De-Mesquita, Peeters, Melander, Hallmans, Riboli, Saracci, Vinei, 1). It is one thing to knowingly put yourself at risk, but where do the moral issues stand with drug users when it comes to society and the well-being of others?

Smokers must understand that their smoking extends beyond the puffs of smoke they are inhaling. When individuals smoke, those who are in their environment smoke with them. The Dental Health Foundation states that "second-hand smoke contains at least 50 known carcinogens and other harmful chemicals." Not only is smoking the single most important preventable cause of illness and death, but it is "responsible for an estimated 30% of all cancer diseases and deaths and 90% of all lung cancers. Compared to those who have never smoked,

smokers are almost twice as likely to have a heart attack. Smokers shorten their life expectancy by 10–15 years on average. By simply quitting smoking, however, smokers can, over time, reduce their risk levels."

Where then is my hope—who can see any hope for me?

-Job 17:15

"Dental health involves a singular focus on dentition (teeth), but oral health is a more comprehensive concept that includes the well-being of the oral cavity and areas of the head and neck, including aspects of function and appearance," says McNeil, Crout, and Marazita. "Important health factors related to oral health but not typically considered part of dental health include diet, tobacco use, psychological functioning, pregnancy, cardiovascular disease, and head and neck cancer." Thus far, I have showed how drugs effect an individual psychologically and physiologically, and now I will focus on how smoking is damaging to oral health.

Smoking has been shown to be linked to oral cancer and other common oral conditions, such as tooth loss, dental caries, and periodontal disease. The Dental Health Foundation states that "tobacco contains chemicals that are harmful to the human body and the smoking or chewing of tobacco is the cause of 80–90% of oral cancers. Other oral consequences of tobacco consumption include increased risk of periodontal disease, bad breath, tooth discoloration, an increased build-up of dental plaque, and delayed healing following tooth extraction, periodontal treatment or oral surgery."

"Every tooth in a man's head is more valuable than a diamond."

Miguel de Cervantes

According to *My Virtual Medical Centre,* several diseases and lesions in the mouth are caused by, or can be attributed to smoking, such as:

- Staining of teeth and dental fillings;
- Reduction of the ability to smell and taste;
- Halitosis (bad breath);
- Smoker's palate, where the palate becomes white and a number of little spots project from the surface, each bearing a small red spot at the center that marks the opening of the duct of the gland;
- Smoker's melanosis, which is associated with cigarette and pipe smoking, and is seen as brown spots inside the mouth;

- Coated tongue, which is the condition where there is a colored layer composed of mainly food particles, bacteria, and debris from epithelium in the mouth;
- Oral thrush, which is a type of fungal infection that occurs in the mouth;
- Gum disease;
- Tooth decay (dental caries);
- The failure of dental implants; and/or
- Oral pre-cancer and cancer.

My Virtual Medical Centre continues to project the causes of why "these lesions most likely result," and that is from the:

- Irritants, and toxic and cancer causing compounds found in the smoke;
- Dryness in the mouth following high temperatures of inhaling smoke;
- pH change;
- Change in immune response; and/or
- Change in ability to handle viral and fungal infections.

Studies in previous decades had shown that "severe gum disease in smokers was caused by poor dental hygiene, and was made worse by smoking." Today, it is known that "smoking when adjusted for poor dental hygiene still causes more gum disease than non-smokers," where smokers are seen to have a "2.5 to 3.5 greater risk of severe gum disease, which is recognized by the amount of bone lost around a particular tooth due to gum disease. Smokers also tend to lose more teeth than non-smokers." Due to the smoker's risk of gum disease, the risk of implant failure becomes greater when compared to a non-smoker, due to the severity of gum disease and the "exposure of tobacco smoke to the gums and around the implant." (Chandra)

There are three ways smoking contributes to gum disease, and that is by the number of bad bacteria found in the mouth, what happens in the blood vessels in the gums, and the way our body responds to bacteria. "Three common bacteria that are involved in gum disease, Porphyromonas gingivalis, Aggregatibacter actinomycetemcomitans, and Prevotella intermedia. The higher quantity of these specific bacteria's are seen to cause gum disease."

At time of a dental procedure, the smoking patient can be seen to have less inflammation and bleeding compared to a non-smoker. For example, when 29-year-old patient Adam Gevorkyan flosses or has a dental procedure done, he believes that the absence of blood is a good thing. On the contrary, "the reason for this is due to a constriction in blood vessels in the facial area. This constriction does not simply go away once people stop smoking but lasts for a while after

smoking has stopped. The reduction in inflammation around the gums may also lead to a false sense of security that the gums are healthy, as one of the indicators dentists use to measure gum health is the amount of inflammation around the gums."

Smoking alters many of the ways the body's responses, one of those alterations are in the way the body responds to the bacteria that is in plaque. Plaque is a soft, sticky, whitish mat-like film attached to tooth surfaces, formed largely by the growth of bacteria that colonize the teeth. When the bad bacteria present in a smoker's plaque is in a higher quantity than what is found in a non-smoker, the body "reduces the ability of the body to respond well to the bacteria and thus causes gum disease." Also, the compound nicotine "can cause a reduction in the immune system."

"The main way our body responds to bacteria is through inflammation, and neutrophils are the most critical cell in protection against gum disease. Smokers have more neutrophils in the body, however fewer neutrophils reach the gums mainly due to the effects of nicotine." (Chandra) Also, fewer neutrophils reach the gums due to the constriction of the blood vessels, as mentioned earlier. Therefore, since neutrophils cannot control the bacteria as well as they should due to the fewer amount reaching the gums, there is a much higher chance of developing gum disease. "The destruction of the gums also occurs much faster in smokers due to the presence of a higher number of matrixmetalloproteinases (MMPs), elastase, interleukin-1 and prostanglandin-2. These are components of the body's immune response that are involved in inflammation, loss of collagen, and loss of bone." (Chandra)

By showing the effects of smoking on the oral cavity, "it is clear that nicotine and various compounds in tobacco may impose detrimental effects on the blood system, inflammatory process and immune system." These detrimental effects do not stop at the oral cavity and can be linked back to the development of lung cancer and cardiovascular disease. Smoking patient's must be counselled about all of the oral diseases and conditioned caused by smoking while continuing to follow through the process of helping these patient's understand and eventually quit smoking, for better oral and overall health.

Drugs are the enemies of ambition and hope-and when we fight against drugs we are fighting for the future.

-Bob Riley

According to the National Institute on Drug Abuse, illicit drug use in the United States has been increasing. In 2013, an estimated 24.6 million Americans aged 12 or older—9.4 percent of the population—had used an illicit drug in the past month. This number is up from 8.3 percent in 2002. Marijuana use has increased since 2007. In 2013, there were 19.8 million current users—about 7.5 percent of people aged 12 or older—up from 14.5 million (5.8 percent) in 2007. Cocaine use has gone down in the last few years, where in 2013, the number of current users aged 12 or older was 1.5 million, where in the years 2002 to 2007, the numbers ranged from 2.0 million to 2.4 million. Methamphetamine use was higher in 2013, with 595,000 current users, compared with 353,000 users in 2010.

Most people use drugs for the first time when they are teenagers. There were just over 2.8 million new users of illicit drugs in 2013, or about 7,800 new users per day. Over half (54.1 percent) were under 18 years of age, where more than half of new illicit drug users begin with marijuana. Drug use is highest among people in their late teens and twenties, where in 2013, 22.6 percent of 18- to 20-year-olds reported using an illicit drug in the past month.

But why is illicit drug use increasing when the risks are so high? It is no secret that smoking has become more deadly and addictive than it was 50 years ago. Daniely Payne published an article in the DailyMail on how a charity by the name of: "The Campaign for Tobacco-Free Kids" shows how cigarettes have changed in the last five decades. Doctors at the charity say that cigarettes today pose an even greater risk of disease than those sold in 1964 when the first warning about the health dangers came from the Surgeon General in the U.S.

There are nine ways tobacco companies make cigarettes more addictive, attractive and deadly. First is the addition of bronchodilators—this addition increases chemicals that expand the lungs' airways, which make it easier for tobacco smoke to pass in the lungs, increasing nicotine. Tobacco companies also increase the amount of nicotine, since they control the delivery and amount of nicotine to ensure addiction. The addition of ventilated hole in the filters cause smokers to inhale more vigorously, drawing carcinogens more deeply into the lungs. Adding menthol cools and numbs the throat to reduce irritation and make smoke feel smoother—also the addition of sugars make tobacco smoke easier to inhale and form acetaldehyde, which enhances nicotine's addictive effects. Added levulinic acid, an organic acid salt, reduces the harshness of nicotine and makes smoke smoother and less irritating. The addition of ammonia compounds

increases the speed with which nicotine hits the brain. American style cigarettes are made with blended tobacco, which has a much higher level of cancer-causing nitrosamines. Lastly, added flavors like liquorice and chocolate mask the harshness of smoke and make products more appealing to new users, especially kids.

In a fact sheet on the tobacco industry marketing by the Centers for Disease Control and Prevention, it is stated that Cigarette and smokeless tobacco companies spend billions of dollars each year to market their products, where in 2011, cigarette companies spent $8.37 billion on ads and promotional expenses in the United States alone -- even with tight federal regulations on advertising. That breaks down to about $23 million a day or $27 for every American per year. It is also stated that warnings on cigarette packs themselves have used increasingly stronger language over the years. In 1965, federal law required the warning "Caution: Cigarette smoking may be hazardous to your health" be placed on a side panel of the pack, according to the CDC. That changed to "Warning: Cigarette smoking is dangerous to health and may cause death from cancer and other diseases" in 1967, then "Warning: The Surgeon General has determined that cigarette smoking is dangerous to your health" in 1969.

Today's packs use one of four warnings, including "Surgeon General's warning: Smoking causes lung cancer, heart disease, emphysema and may complicate pregnancy" and "Surgeon General's warning: Quitting smoking now greatly reduces serious risks to your health." But while all this money is being spent on advertising and marketing, and users know that smoking will kill them, why do they continue to smoke? It has been shown that while smoking harms your health, it is not noticeable at first. That's why the World Health Organization calls tobacco a "gradual killer." By the time smokers may feel the effects, they're addicted. Due to other risk factors such as the environment the smoker is in, family, education, and personality, there is less of the capacity of choice anymore to quit smoking because the addiction is too strong.

The quote by Bob Riley was meant to show that nothing drastic is being done although the need for something to be so is desperate. But it is not to say that nothing at all is being done: smoking is still the number one cause of preventable death in the United States, and has been for decades. It kills more people than obesity, substance abuse, infectious disease, firearms, and traffic accidents, according to the CDC. Some 443,000 Americans die from smoking-related illnesses every year, according to the U.S. Department of Health, but government anti-smoking

efforts have saved 8 million lives. As I mentioned at the beginning of my research journey, understanding and empathy is key to coming to a solution to helping patient's and all other people we encounter who smoke come to a quit. The journey is not easy for any smoker but the hope to quit is alive in many—according to the Centers for Disease Control and Prevention (CDC), 68.8 percent of smokers say they want to quit completely. But in order to make this number reach 100 percent, we must continue to spread awareness on drugs, especially tobacco. It is stated by the CDC that "tobacco is thought to contain about 70 cancer-causing chemicals (carcinogens). These chemicals can result in the development of smoking-related diseases such as lung cancer, heart disease, and stroke. In an effort to prevent these diseases, millions of smokers attempt to quit each year."

Amanda Sandford published an article in the *Official Journal of the Asian Pacific Society of Respirology* titled "government action to reduce smoking," where she states: "the major health impacts of smoking were established more than 40 years ago but governments were slow to respond to the growing health epidemic. Despite laudable tobacco control strategies in many countries, globally deaths from smoking continue to rise and are forecast to reach 10 million a year by the 2030's. There is now general agreement that in order to substantially reduce smoking rates, governments need to adopt a comprehensive approach to tobacco control. This should include a range of measures, notably: a total ban on tobacco advertising and promotion; restrictions on smoking in public places and in the workplace; sustained increases in tobacco taxation combined with measures to curb smuggling; large, bold health warnings on tobacco products; smoking cessation and health education campaigns; and the regulation of tobacco to standards agreed by the health community rather than those set by the tobacco industry. While legislation is to be favored over voluntary controls, the key to the successful implementation of these measures is winning public support and ensuring proper enforcement." This is a solution that can be practiced in order to reduce smoking worldwide. "However," as Sandford mentions "the picture is far from uniform and some of the best examples of strong, government-led action have occurred in less developed nations." By understanding this, governments can learn much from these countries by working together and, "by supporting the impending global treaty on tobacco control, can help to reduce the smoking-related diseases and deaths of the future."

Adam has shown great potential throughout this journey whereas Amelia, Daniel, and Fatmir do not believe it's in their best interest to quit smoking. Although some smokers do understand that smoking is dangerous, either they believe it is too late for them to quit, or they simply do not want to do so. Adam states that every day he battles "the decision of whether or not to buy a pack of cigarettes, or even smoke at all." But bad habits are hard to break, but he believes that he can, for his own health, his fiancées, and for everyone around him. One of the best methods he uses to refrain himself from smoking is when he is around his fiancée, because she always tells him to that he needs to quit sooner than later. Adam also shows much hope for the future, where he states that he will never put his family at risk when he has children one day. The goal to help patient's like Adam, Amelia, Daniel, and Fatmir quit smoking is to give them a reason to do so. The damaging effects of smoking are not all so obvious at the beginning or before the development of a disease. It will only be real when it happens—but sometimes when it does happen, it is too late to fix. Therefore, all health professionals should take into consideration a patient's feelings and struggles when it comes to the topic of quitting and help design a unique treatment plan to do so.

For what will a man give in exchange for his soul?

-Mark 8:37

BIBLIOGRAPHY:

1. Bain CA, Moy PK. The association between the failure of dental implants and cigarette smoking. *Int J Oral Maxillofac Implants*. 1993; 8(6): 609-15.

2. Califano, Joseph A. "Addiction in America." *Yale Law & Policy Review* 8.1 (1990): 1-7. Web.

3. "CDC - Fact Sheet - Smoking Cessation - Smoking & Tobacco Use". Smoking and Tobacco Use. N.p., 2016. Web. 11 July 2016.

4. "CDC - Fact Sheet - Tobacco Industry Marketing - Smoking & Tobacco Use". Smoking and Tobacco Use. N.p., 2016. Web. 5 July 2016.

5. "CDC - Surgeon General's Reports - 2000 - Warning Labels - Smoking & Tobacco Use". Smoking and Tobacco Use. N.p., 2016. Web. 5 July 2016.

6. Chandra, Dr. Akhil. "How Smoking Affects The Mouth | Myvmc". myVMC. N.p., 2009. Web. 25 July 2016.

7. Cloud, William, and Granfield Robert. *Recovery from Addiction: A Practical Guide to Treatment, Self-Help, and Quitting on Your Own*. NYU, 2001. Web.

8. Dodes, Lance. "The Psychological Basis Of Addiction". Pro Talks: A Rehab.com Community. N.p., 2014. Web. 5 June 2016.

9. "Drug Abuse, Addiction, And The Brain". WebMD. N.p., 2016. Web. 13 June 2016.

10. "Drug Abuse And Addiction Symptoms, Signs, Treatment, Cause And Prevention On Medicinenet.Com". MedicineNet. N.p., 2016. Web. 13 June 2016.

11. Eggert FM, McLeod MH, Flowerdew G. Effects of smoking and treatment status on periodontal bacteria: Evidence that smoking influences control of periodontal bacteria at the mucosal surface of the gingival crevice. *J Periodontol*. 2001; 72(9): 1210-20.

12. Everitt BJ. 2014. Neural and psychological mechanisms underlying compulsive drug seeking habits and drug memories—indications for novel treatments of addiction. *Eur. J. Neurosci.* 40:2163–82

13. Eyal, Nir. "Can’t Kick A Bad Habit? You’re Probably Doing It Wrong". Psychology Today. N.p., 2016. Web. 1 Aug. 2016.

14. Gallo, Valentina, Neasham David, Airoldi Luisa, Ferrari Pietro, Jenab Mazda, Boffetta Paolo, Overvad Kim, Tjønneland Anne, Clavel-Chapelon Francoise, Boeing Heiner, Pala Valeria, Palli Domenico, Panico Salvatore, Tumino Rosario, Arriola Larraitz, Lund Eiliv, Bueno-De-Mesquita Bas, Peeters Petra H., Melander Olle, Hallmans Goran, Riboli Elio, Saracci Rodolfo, and Vineis Paolo. "Second-hand Smoke, Cotinine Levels, and Risk of Circulatory Mortality in a Large Cohort Study of Never-Smokers." *Epidemiology* 21.2 (2010): 207-14. Web.

15. Geng Y, Savage SM, Razani-Boroujerdi S, Sopori ML. Effects of nicotine on the immune response. II. Chronic nicotine treatment induces T cell anergy. *J Immunol*. 1996; 156(7): 2384-90.

16. Glover, Jonathan. Alien Landscapes?: Interpreting Disordered Minds. Harvard UP, 2014. Web.

17. "Habit Formation | Psychology Today". Psychologytoday.com. N.p., 2016. Web. 1 Aug. 2016.

18. Hirshbein, Laura D. "The Many Faces of Nicotine." *Smoking Privileges: Psychiatry, the Mentally Ill, and the Tobacco Industry in America*. Rutgers UP, 2015. 82-96. Web.

19. Hommel B. 2009. Action control according to TEC (theory of event coding). *Psychol. Res.* 73:512–26

20. Jarvis, Martin J. "ABC of Smoking Cessation: Why People Smoke." *BMJ: British Medical Journal*328.7434 (2004): 277-79. Web.

21. Karine M. Markosyan, Aramayis Kocharyan, and Artur Potosyan. "Meeting the Challenge of Injection Drug Use and HIV in Armenia." *Health and Human Rights* 9.1 (2006): 128-51. Web.

22. Markou, Athina. "Neurobiology of Nicotine Dependence." *Philosophical Transactions: Biological Sciences* 363.1507 (2008): 3159-168. Web.

23. McNeil, Daniel W., Crout Richard J., and Marazita Mary L. "Oral Health."*Appalachian Health and Well-Being*. Ed. Robert L. Ludke and Phillip J. Obermiller. By Richard A. Couto. U of Kentucky, 2012. 275-94. Web.

24. Oral health of substance-dependent individuals: Impact of specific substances. D'Amore, Meredith M. et al. Journal of Substance Abuse Treatment, Volume 41, Issue 2, 179 – 185

25. "People Who Inject Drugs (PWID) And HIV/AIDS | AVERT". Avert.org. N.p., 2016. Web. 11 July 2016.

26. Preber H, Linder L, Bergstrom J. Periodontal healing and periopathogenic microflora in smokers and non-smokers. *J Clin Periodontol*. 1995; 22(12): 946-52.

27. Redish AD, Jensen S, Johnson A. 2008. A unified framework for addiction: vulnerabilities in the decision process. *Behav. Brain Sci.* 31:415–37

28. Sandford, Amanda. "Respirology". Official Journal of the Asian Pacific Society of Respirology 8.1 (March 2003): 7-16. Print.

29. Seow WK, Thong YH, Nelson RD, MacFarlane GD, Herzberg MC. Nicotine-induced release of elastase and eicosanoids by human neutrophils.*Inflammation*. 1994; 18(2): 119-27.

30. Sorensen LT, Nielsen HB, Kharazmi A, Gottrup F. Effect of smoking and abstention on oxidative burst and reactivity of neutrophils and monocytes.*Surgery*. 2004; 136(5): 1047-53.

31. Thorndike EL. 1898. Animal intelligence: an experimental study of the associative processes in animals. Psychol. Monogr. Gen. Appl. 2:1–109

32. Under the Influence: Informing Oral Health Care Providers About Substance Abuse. Riemer, Lynn et al. Journal of Evidence-Based Dental Practice, Volume 14, 127 - 135.e1

33. "Understanding Drug Abuse And Addiction". Drugabuse.gov. N.p., 2016. Web. 13 June 2016.

34. UNAIDS, Joint United Nations Programme on HIV/AIDS (UNAIDS). The Gap Report. 2014; ISBN 978-92-9253-062-4. UNAIDS/JC2656 (English original, July 2014, updated September 2014).

35. Walter C, Saxer UP, Bornstein MM, Klingler K, Ramseier CA. [Impact of tobacco use on the periodontium-an update (I)-Part 1: Epidemiologic und pathogenetic aspects of tobacco-related periodontal diseases]. [Article in French, German]. *Schweiz Monatsschr Zahnmed*. 2007; 117(1): 45-60.

36. Warren, C. W., Jones N. R., Chauvin J., and A Peruga for the GTSS Collaborative Group. "Tobacco Use and Cessation Counselling: Cross-Country. Data from the Global Health

Professions Student Survey (GHPSS), 2005-7." *Tobacco Control* 17.4 (2008): 238-47. Web.

37. Wood, Wendy and Dennis Rünger. "Psychology Of Habit". Annual Review of Psychology 67.1 (2016): 289-314. Web.