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Region: Midwest #1 – North Dakota, South Dakota, Wisconsin, Minnesota, Nebraska

A. Regional Parameters:

Overview of the Midwest Region:

In comparison to other parts of the country, the Midwest has lower rates of prescription and illegal misuse. However, according to the CDC report, there are more hospitalizations due to the opioid epidemic in the Midwest. Also, all poisonings related to substance misuse were high in the Midwest region.

Demographics of Age:

Drugs were abused by people of all ages. In 2016, 20% of men and a little more than 15% of women misused prescription or illegal drugs. Regarding the opioid crisis, both men and women have been misused prescribed painkillers and ages range from 12 to seniors. Additionally, teenagers and those in early 20s are likely to overdose. They have access to opioids at someone's home and then become addicted for the "high" feeling.

North Dakota:

The most commonly abused drugs in North Dakota are marijuana and amphetamine. Marijuana is the primary drug of abuse. In 2010, there were about 696 people who went to drug and alcohol rehabilitation centers for marijuana addiction in which 65.9% were male and 33.6% were female. The largest age group to undergo treatment for this condition was 12 to 17-year-old adolescents. On the other hand, approximately 145 people (44.1% male and 55.9% female) went to substance abuse treatment for amphetamine addiction in 2010. They were mostly 21 to 25-year olds.

In 2016, there were 54 reported overdose deaths in North Dakota which averages to 7.6 deaths per 100,000 people which is less than half the national rate of 13.33 deaths per 100,000 people. Additionally, about opioid prescribing, North Dakota providers wrote 60 opioid prescriptions per 100 people which is approximately a total of 466,000 prescriptions. This is less than the average national rate of writing 70 opioid prescriptions per 100 people.

South Dakota:

In South Dakota, most of the population entered substance abuse treatment for alcohol abuse. In 2010, approximately 7,000 people were admitted to alcohol abuse as the primary drug of choice and an additional of 4,000 people consumed alcohol with a secondary drug. Aside from alcohol, the most abused substances in South Dakota are marijuana and amphetamines. In 2007, more than 60% of drug treatment admissions were for marijuana abuse. Most of them were 12 to 17-year-old. On the other hand, stimulants such as methamphetamines and other opiates were the second most common drugs of abuse in South Dakota. In 2010, approximately 650 people entered treatment for amphetamine dependence. Additionally, people were admitted for treatment due to opiate prescription drugs. The largest age group admitted for this reason was the 21 to 25-year-olds. Another trending drug among teenagers and young adults in South Dakota is 25i, a synthetic hallucinogen that produces similar effects as LSD.

The South Dakota judicial court is unforgiving when pertaining to drug-related crimes. Those who are charged for possessing, selling, or producing drugs are met with steep fines and/or lengthy prison sentences. To determine the appropriate drug offenses in South Dakota, substances are categorized into schedules in accordance to their probability of abuse and accepted use in the medical setting:

- Schedule I (highest potential for abuse and no accepted medical use in the U.S.): heroin, dextromoramide, benzethidine, phenomorphan, methaqualone
- Schedule II (high potential for abuse and accepted medical use under severe restrictions): fentanyl, methadone
- Schedule III (less addictive than Schedule I and II drugs and are approved for medical uses): ephedrine, benzphetamine
- Schedule IV (low potential for abuse and fully accepted medical use): benzodiazepines

In 2016, there were 42 reported opioid-related overdose deaths in South Dakota. There was a rate of 5 deaths per 100,000 people which is well below the national rate. Pertaining to opioid prescriptions, South Dakota providers wrote 67.8 opioid prescriptions per 100 people; this amounted to 582,000 opioid prescriptions.

Wisconsin:

Like South Dakota, most of the Wisconsin population were admitted to rehabilitation centers for alcohol dependence in 2010 and many of them combined alcohol with a secondary drug. In Wisconsin, heroin is considered as a cheaper alternative to opiates. Additionally, marijuana is the primary drug of abuse in which the largest age group of consumption was 21 to 25-year-olds. Other popular abused drugs are cocaine, amphetamines, and prescription drugs.

In 2016, there was a rate of 15.8 deaths per 100,000 people which is slightly higher than the national average. Since 2010, there was approximately a fourfold increase of heroin overdose deaths. Similarly, deaths due to synthetic opioids (mainly fentanyl) and prescription opioids have increased. As for prescriptions, in 2015, Wisconsin provides wrote 69.1 opioid prescriptions per 100 people which totaled to 4 million prescriptions.

Minnesota:

Marijuana is the most commonly abused drug in Minnesota. The use of marijuana in the past year is reported more by adult males than females and by young people of 18-24 years old. Approximately 6.97 percent of Minnesota residents reported past-month use of illicit drugs. In 2011, 19 % of treatment admissions were for non-heroin opiates (including prescription drugs) and 18 % of treatment admissions were for stimulants.

Club drugs such as ecstasy, GBL, Rohypnol, LSD, Ketamine, GHB, and PCP are also a problem in Minnesota.

In 2016, there were 396 opioid-related overdose deaths--- in Minnesota—a rate of 7.4 deaths per 100,000 persons compared to the national overdose death rate. From 2009 to 2016, the number of heroin-related deaths increased from 16 to 149; deaths related to synthetic opioids rose from 39 to 99; deaths from prescription opioids remained stable from 177 to 195.

The abuse and illegal sale of prescription drugs, such as OxyContin, has also significantly increased. Seizures and arrests have included involve both pills and fentanyl patches.

Nebraska:

In Nebraska, the primary drugs of abuse are stimulants and methamphetamine. It is most popular among Nebraskan residents of ages 12 and older. In fact, the use of methamphetamine is even higher than marijuana. According to Treatment Episode Data Set (TEDS), 35% of primary drug treatment admissions were due to stimulants while it was 27% were for marijuana abuse (secondary drug of abuse) in 2011. In 2010, 1,191 people were admitted to drug rehabilitation for amphetamine dependence (48.4% male and 51.6% female) and were mostly 26 to 30-years-old.

When comparing with the national average, the drug problem in Nebraska is lower – as reported by the Executive Office of the Whitehouse in 2013. It was estimated that approximately

7.01 percent of Nebraska residents used illegal drugs while the national average was at 8.82%. In 2016, there was a rate of 2.4 deaths per 100,000 people in Nebraska.

In Nebraska, alcohol and prescription drugs are of legal status but are still commonly abused. Other popular opioids abused in Nebraska is Oxycodone (OxyContin) and any form of cough syrup containing codeine. Therefore, Nebraska classifies controlled substance in five schedules. Schedules I, II, III are considered to be highly addictive and dangerous; crimes involving these schedules carry the most several penalties. Schedules IV and I include some anti-anxiety and opioid prescription drugs; penalties involving these drugs are not as harsh but possession of these drugs without a prescription is still considered as a serious crime.

Generic/Brand/Street Names of Commonly Abused Drugs:

Marijuana (cannabis) – street names include boom, baby, chira, aunt Mary, grass, ditch, herb, ganja, hash, pot, weed, root, torch, etc.

Methamphetamine (Desoxyn) – street names include meth, crack, ice, jib, speed, glass, tina, chalk, fire, crystal meth, etc.

Cocaine – street names include candy, coke, C, girl, freeze, Mama Coca, nose, shot, snow, pimp, sugar, white powder, sweet stuff, etc.

Oxycodone (OxyContin, Percocet) – street names include hillbilly heroin, blues, kickers, Oxy, etc.

Pharmacology of Heroin/Alcohol/Cocaine/Methamphetamine:

Heroin binds to opiate receptors in reward and pleasure centers of the brain to induce euphoria. It also binds to the brain, spinal cord, and periphery to reduce pain sensation. The physiological effects last for 3-5 hours but can lead to acute toxicity – respiratory depression. Some symptoms of heroin overdose include blue lips and nails, seizures, muscle spasms, coma, and death (Dr. Flamer-Caldera, Drugs of Abuse PPT).

Alcohol is a CNS depressant and affects multiple neurotransmitter systems. It enhances the inhibitory effects of GABA on its receptor. Some symptoms of alcohol poisoning include impaired speech, irregular/slow heartbeat, hypothermia, respiratory depression, etc. (Dr. Flamer-Caldera, Drugs of Abuse PPT).

Cocaine increases the concentration of monoamines in the synaptic cleft by inhibiting the actions of monoamine reuptake transporters. Its effects last 1-2 hours and symptoms include euphoria, mydriasis, mental alertness, etc. Adverse effects include rapid heartbeat, hallucinations, respirations failure, stroke, etc. (Dr. Flamer-Caldera, Drugs of Abuse PPT).

Methamphetamine are synthetic, addictive stimulant produced from pseudoephedrine or ephedrine found in cold medicines. It inhibits monoamine reuptake transporters. Its effects last 8-12 hours and are like the effects of cocaine. Toxic effects include neurotoxicity, permanent psychosis, hyperthermia, kidney failure, coma, stroke, heart attack, etc. (Dr. Flamer-Caldera, Drugs of Abuse PPT).

History of Accessibility to Drugs (Points of Entry to the Midwest Region):

The Midwest region is considered a "High Intensity Drug Trafficking Area (HIDTA)." Many illicit drugs are transported to the Midwest from Mexico, California, and southwestern states by private and commercial vehicles. Additionally, Mexican drug trafficking organizations are responsible for the prevalent methamphetamine presence in the region. Other widely abused drugs include Mexican black tar, brown powder heroin, controlled prescription drugs, cocaine, and marijuana.

Secondary Markets: In North Dakota, the Fargo/Grand Forks represent a big market for illicit drugs. In South Dakota, the Sioux City/Sioux Falls area represents a regional distribution

center for methamphetamine, marijuana, cocaine, and MDMA. There drugs are distributed to markets in Minnesota, Nebraska, and South Dakota.

Oversight of Opioid Prescribing:

There is a vast problem regarding opioids and prescription drug abuse. Therefore, many states implemented the "Prescription Drug Monitoring Program" to keep track of controlled substances prescribed by physicians and distributed by pharmacies. The Administrations Prescription Drug Abuse Prevention Program suggests a national framework to reduce prescription drug diversion and abuse by supporting the expansion of state-based prescription drug monitoring programs and recommending secure, convenient, and environmentally responsible disposal methods to remove expired, unused, or unneeded medications. Additionally, the framework is to educate patients and healthcare providers and reduce the prevalence of pill mills and doctor shopping through enforcement efforts.

Oversight of Local Pharmacy Opioid Inventory:

The DEA requires every regional local pharmacy to keep track of the controlled substance inventory. Nowadays, many systems are available to track exactly how much of each opioid is in stock. The tracking system allows the staff to know when the opioids are to be filled, how many are already filled, and if any potential diversion is occurring. Additionally, the system can alert pharmacists if there is an excessive amount of medication being ordered and whether those thresholds are in violation of any agreements they have with their medication vendors. These alerts can minimize the chances of medication theft or alert the pharmacist to stop prescribing. Pharmacies are required to conduct annual inventories and report losses to the DEA.

This electronic drug prescription monitoring program became widely adopted by every state in the Midwest region (except Missouri).

Treatment Centers/Program/Strategies and Media/Medical Community Response:

To alleviate the opioid epidemic, the CDC developed a program called the Overdose Prevention in States (OPIS). Through this program, the CDC is working with 45 states and Washington DC to "provide scientific expertise, enhanced surveillance activities, and support resources" (CDC). There are three programs that prepare the states with the necessary resources to address the opioid epidemic: Prevention for States (PfS), Data-Driven Prevention Initiative (DDPI), and Enhanced State Opioid Overdose Surveillance (ESOOS). The purpose of PfS is to "provide state health departments with resources and support needed to advance interventions for preventing prescription drug overdoses" (CDC). Their activities include maximizing prescription drug monitoring programs, enforcing community or insurer/health systems interventions, holding periodic policy evaluations, and implementing rapid response project. Additionally, the DDPI funds state to improve data collection and analysis about opioid misuse, abuse, and overdose and the ESOOS provides a more timely and comprehensive data on fatal and nonfatal opioid overdoses and risk factors related to fatal overdoses (CDC). Among the Midwest #1 region, PfS is funded in Wisconsin and Nebraska; DDPI in South Dakota and Minnesota; and ESOOS in Wisconsin and Minnesota.

However, unfortunately, in a recent article published in Newsweek.com, "there was a 70% rise in the number of overdose cases arriving at emergency departments in the Midwest during the 14 months to September 2017." Also, a recent report from the Midwest Economic Policy Institute emphasized the devastating impact of the opioid epidemic on the Midwest region's construction industry (Newsweek.com). Construction workers are vulnerable to the epidemic because they take painkillers to return to work quickly and, unknowingly, they become addicted.

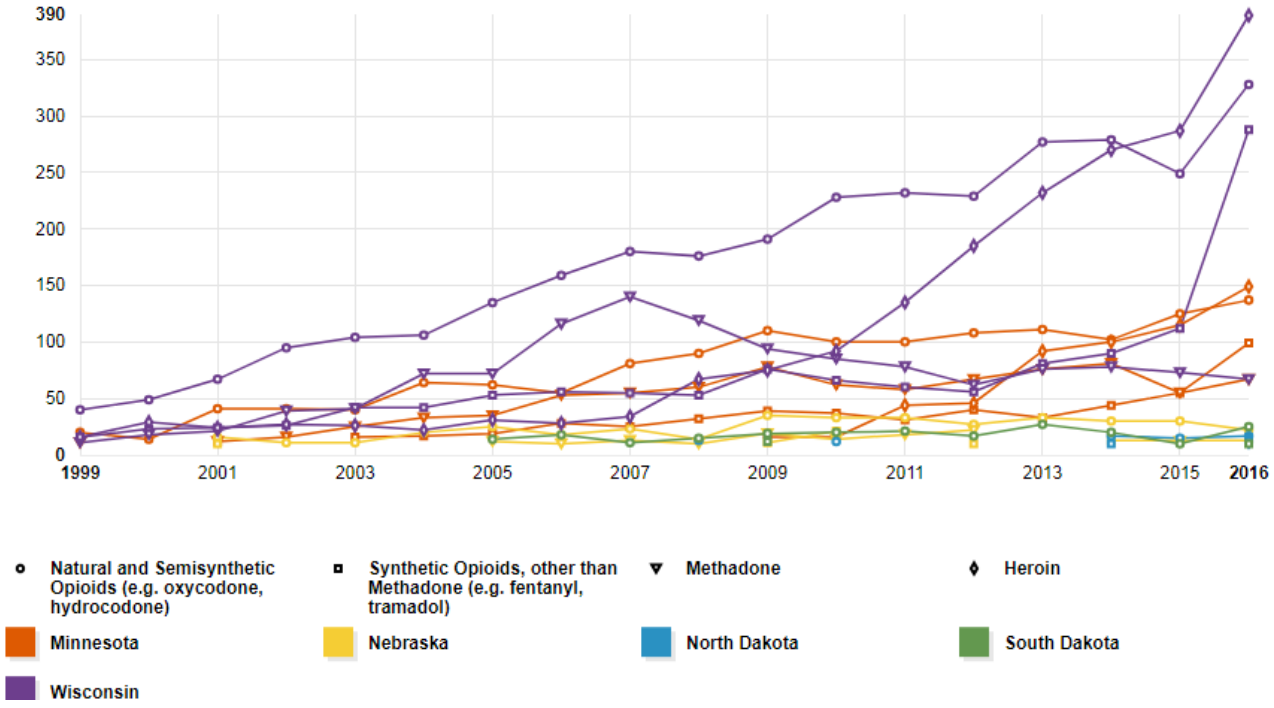
Other strategies/programs: naloxone law and naloxone kit distribution, drug take back programs.

Regional Media Response: National Anti-Drug Media Campaign "Above the Influence" – purpose is to inspire the youths to reject and to stop using drugs and drinking.

Regional Overdose History and Trend (1999 to 2016):

According to the trend graph provided by the KFF Henry J. Kaiser Family Foundation and data provided by the National Vital Statistics System, Wisconsin has the most opioid-related overdose deaths while South Dakota and Nebraska have the least (See Graph 1) among the Midwest #1 region. There has always been an increasing trend, but there was a sharp upturn in 2015 – increase in number of deaths related to heroin, natural and semisynthetic opioids (e.g. oxycodone, hydrocodone), and synthetic opioids other than methadone (e.g. fentanyl and tramadol).

Graph 1: Opioid Overdose Deaths by Type of Opioid in 1999 – 2016 for Midwest #1 Region



B. IMPACT STORY

Hooked on heroin.

Dylan Pearson was a 19-year-old boy from St. Francis, Minnesota. Dylan started experimenting with various drugs when he was in high school. One day he tried heroin and he became very addicted to it. Dylan underwent various drug treatment programs that seemed to help him for some period of time. The last program he successfully completed was in Florida. After the completion of that program, Dylan came back home. He seemed to feel good and happy. However, he died two weeks later, on January 31st, 2015 from a heroin overdose. His stepfather found him dead in his bed.

Dylan's parents are still heartbroken. They did not touch his clothes, they did not move his shoes. His parents still cannot believe that their only child is gone.

https://www.kare11.com/article/entertainment/television/programs/kare-11-extras/hooked-on-heroin-minnesota-families-grieving-the-drugs-death-toll/89-165302770

Describe the impact of that event as it relates to family, community, and school environments (whichever apply).

Dylan was the only child in his family. His death was a big shock for everybody and his parents still cannot believe it happened to them. Dylan's mom goes to his grave every single day and she is inconsolable with grief. In her son's memory, she created a non-profit organization called "Free Heroin Holds" that sponsors treatment programs for other drug addicted people who are in need. She helps other families whose loved ones are struggling with addiction and she supports families who lost their kids because of heroin addiction.

Dylan's mom said: "I still can't believe it happened to us because I was the most involved mom there is. You can still be involved but it doesn't make a difference..." She said she did everything to save her son's life, but she could not, she was powerless. This is the reason why she decided to help other families to fight a heroin addiction and to save their kids before it is too late.

What did you connect most strongly with in the story? Is this type of story rare or common for that region?

This story really touched my heart. It demonstrates and proves how people are powerless over heroin, how heroin can take their lives. You can be rich or poor, male or female, white or black, heroin does not make exceptions, it will take every single life it can. Addiction does not discriminate people by race, ethnicity, gender or socioeconomic status. Heroin changes a person's life to such a degree that a person becomes defenseless and weak. You can try to quit, go to rehab, undergo various medical treatment programs, but still be hooked on heroin and die in your bed when you least expect it. It is so sad and incredibly wrong when a parent has to bury his child. It is horrible when young kids who have the whole bright future in front of them are losing their lives for nothing and are dying from an overdose. Heroin is so potent that most people cannot say no to it and cannot stop even though they understand the consequences of their addiction.

Unfortunately, this type of story is fairly common for that region. In 2016 396 people overdosed and died from opioids in Minnesota. Heroin abuse reached an unprecedented level in Minnesota. The number of heroin-related deaths increased from 16 to 149 from 2009 to 2016. More and more people ask for help and go to rehabs. Sadly enough, the largest group of those entering treatment for heroin are white men in their 20s.

The fact that scares me the most is that people are aware of heroin and other opioids potency, side effects and mortality rate. However, they still try drugs just for fun. Most people believe that they will be able to stop after their first try and nothing serious will occur. Wrong, wrong, and wrong. For some people even the first dose may turn out to be their last dose. More and more young people get hooked up on heroin every year. More and more people die from an

overdose. Opioids crisis is a serious problem that should be resolved. Drugs should not be the reason of kids' death and parents should not bury their children.

Were there regional factors that affected the outcomes and consequences in the story?

Minnesota seriously struggles with opioid addiction. In 2015, treatment admissions for heroin exceeded those of marijuana for the first time. Even though Minnesota receives federal money that help to treat addiction, the amount is not enough to stop the epidemic. In reality, the majority of drug-addicts in the United States, around 85%, never get the help they need. As a result, many drug addicts look for help and treatment outside of Minnesota. Dylan was one of these people. He successfully completed several anti-drug programs in Minnesota, he even went to Florida for his last treatment. However, nothing worked, he kept losing control and he got back to heroin again and again. It's incredibly hard to stay drug-free when many people in your community are drug-addicts. According to statistics around two Minnesotans die each day from drug abuse. Drug overdoses now kill more Minnesotans each year than traffic accidents.

I truly believe that Dylan tried to quit heroin, however all the time he came back home, he was spending time with his old environment that was pushing him to start using the drug again and again. He was not strong enough to resist heroine, probably like all drug addicts he truly believed that nothing bad will happen to him and he will never end up like other people that overdosed. Unfortunately, he was not able to stop on time, therefore he lost in his battle with heroin addiction.

C) Role of the dental hygienist

A) History taking, patient accuracy

Not every patient who abuses drugs will readily disclose that information to the dental professionals. Many patients with drug abuse problems deny the fact of their addiction, they do not consider themselves being abusers, which makes their medical history less accurate and not

reliable. Information provided by the patient may be false or partially correct. The patient may lie about the extent of the drug use or completely deny the facts of the use of any drugs. Therefore, thorough clinical observations, extra and intraoral examination along with the medical history may provide greater details about patient real drug-status.

B) Patient communication

The communication process with a drug abuser may be challenging. Drug abusers may behave aggressively, especially if they come to their appointment "high" or under influence of drugs. They may become irritated and annoyed when a dental professional is asking questions about their drug status or suspects them in being drugs abusers. Substance abusers usually deny the fact of being addicted to anything, even when signs of drug abuse are evident and obvious.

The dental hygienist should always stay professional. He should communicate with every patient with respect and he should be able to find the right words for each patient. All questions should be asked and worded carefully. The dental hygienist should ask for facts, he should not express judgments, he should provide a rationale for any procedure that needs to be performed, he should give the patient an option do not answer the question if he/she feels uncomfortable. It is very important to build bonds of trust in between a clinician and a patient. If the patient feels comfortable and safe in the dental chair, if he trusts and respects his clinician he most likely will be cooperative, the communication process will go smoothly and the patient will disclose and share the right information about his drug status more willingly.

c) Treatment planning

Treatment planning should be based on each patient individual needs and condition. The dental hygienist should take into consideration the fact that most drug abusers neglect their oral hygiene and dental health. Therefore, the number of appointments required to provide an appropriate dental

care for a drug abuser needs to be increased. Usually, drug abusers are looking for a dental care only in case of emergency or when they need to get some drugs prescribed by a dentist. Getting the drug is the number one priority for them. Teeth cleaning is not their prime concern. As the result, drug abusers may have poor oral health and major teeth related problems. Xerostomia and reduced salivary flow are very common side effects of drugs that make drug users more susceptible to caries and periodontal disease. Moreover, drug abusers often crave and consume lots of sugar and sugary drinks that lead to enamel erosion. If to compare people who abuse drugs to the general population, drug abusers appeared to be more prone to caries, dentinal hypersensitivity, bruxism and necrotizing ulcerative gingivitis. They also have a higher occurrence of oral lesions, oral candidiasis, leukoplakia, leukoedema, hyperkeratosis, angular cheilitis and stomatitis. The use and abuse of alcohol and tobacco also greatly increases the risk of oral cancer.

d) Direct clinical care

Direct clinical care for the drug abusers may be very challenging as well. First of all, a patient who is under the influence of drugs may behave and act crazily and unpredictably. In this case, the patient should not be treated this day and he should be dismissed right away. In addition to that, a drug dependent patient may respond to local anesthesia differently. Some drugs make a patient resistant to local anesthesia. Others, especially the ones that depress the brain, such as narcotics, sedative-hypnotics and antihistamines, may increase the effects of local anesthetics. On the other hand, stimulants, such as cocaine and methamphetamine, may reduce the effects of local anesthetics. Therefore, the patient may require more local anesthesia during a dental treatment. Moreover, drug dependent patients have an increased risk of cardiovascular complications, therefore mepivacaine should be used instead of epinephrine.

Nitrous oxide analgesia should be completely avoided because it is able to alter mood and thus it can increase the potential for further drug abuse by creating the same or similar pleasurable sensations. In addition to that, the use of benzodiazepines should be avoided as well. The reason is benzodiazepines will create the pleasurable sensations associated with addiction.

As being previously said many drug addicts do not place their oral hygiene health on top of their priorities, therefore their teeth and oral health usually leave a lot to be desired. Clinical management of these patients can be very challenging for dental professionals, it may take a lot of time, dedication and work that needs to be done in order to improve their oral status.

What do you believe the role of the hygienist in the following areas?

A) Self-education on regional drugs / C) Remaining current on abuse trends

When a dental hygienist works in an area with a large prevalence of drugs abuse, it is incredibly important for him/her to stay up to date on abuse trends and to constantly self-educate himself/herself. Self-education and learning about a specific regional and new drugs will help a dental professional to stay on top of a situation, to feel more confident and to be prepared for various treatment outcomes and drug-induced emergencies. Self-education and remaining current on abuse trends will also allow the clinician to better understand the drug mechanism of action and its influence on the patients' oral and mental health.

b) Advising/educating patient on abuse.

Role of a dental hygienist in a patient education and care is incredibly important. A dental hygienist is one of the first people who have an opportunity to notice any changes in the patient's oral health and to suspect that something is wrong with that patient. Dental hygiene professionals who are knowledgeable and educated on drug abuse can better understand their patients' needs and fears, they can find the right words and give proper advice, they can create the right strategies

of treatment, and they are able to guide their patients toward drug cessation programs and to refer them to the right specialists.

d) Ability to identify intraoral markers of drug use.

Many drug users have drug-induced oral complications and side effects that should immediately alert a dental professional to perform further patient interview and investigations. Cracked teeth, enamel erosion, irritated and burned oral mucosa, multiple sores, aggressive rampant dental caries, xerostomia, dryness of the mouth, bruxism, trismus and many others sighs may represent intraoral markers of drug abuse.

It is crucial for a dental hygienist to be able to identify intraoral markers of drug use in order to be able to help the patient, to give the patient appropriate recommendations, to provide the best possible care and to improve the patient oral health.

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