Substance Abuse - Chemical Dependency

September 2007
Updated: April 2011

Nancy J. Williams, RDH, EdD
Wayne McElhiney, DPh, DDS
Current Approvals

ADA CERP

Access Continuing Education, Inc. is pleased to offer this course to you in cooperation with The Academy of Dental Learning who is an ADA CERP recognized provider. Accepted Program Provider ID: #208259 - FAGD/MAGD - 01/01/08 to 12/31/11.

California State

Access Continuing Education, Inc. is an approved provider. California Dental Board Provider Number: RP 4495

Pending Approvals

Access Continuing Education, Inc. is cognizant of professionals needing continuing education credit hours for their professional development, certifications, licensure, etc. Please let us know if you would like to see courses offered for continuing education credit in your field. If we receive multiple requests we will apply to your credentialing body for approval.
**Answer Sheet: Substance Abuse and Chemical Dependency**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ____</td>
<td>5. ____</td>
<td>9. ____</td>
<td>13. ____</td>
<td>17. ____</td>
</tr>
<tr>
<td>2. ____</td>
<td>6. ____</td>
<td>10. ____</td>
<td>14. ____</td>
<td>18. ____</td>
</tr>
<tr>
<td>3. ____</td>
<td>7. ____</td>
<td>11. ____</td>
<td>15. ____</td>
<td>19. ____</td>
</tr>
<tr>
<td>4. ____</td>
<td>8. ____</td>
<td>12. ____</td>
<td>16. ____</td>
<td>20. ____</td>
</tr>
</tbody>
</table>

Name: ____________________________  Profession: ________________

License State: _______ License Number: __ Expiration Date ________ (MM/YY)

Address: __________________________

City: __________________ State: ________ Zip Code: ________________

Telephone Number: _______ Fax Number: __________________________

E-mail: __________________________

**Fax your completed exam to 518-514-1103**

If you have downloaded this course off the Internet and need to provide your credit card information for payment please do so here:

Card type ___________  Card number ________________________________________

Exp. Date ___________  Name as it appears on card __________________________

Please place an X in the box to rate these statements:

<table>
<thead>
<tr>
<th>The content fulfills the overall purpose of the course.</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>The content fulfills each of the course objectives.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The course subject matter is accurate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The material presented is understandable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The teaching/learning method is effective.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The answers to the test questions are appropriately covered in the course.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How would you rate this course overall?

Time to complete the entire course and the test?

| Hours: _______ | Minutes: _______ |

How did you hear about this course?

- Link from Dental Board Website
- Google
- Other Search Engine
- Friend/CoWorker
- Other

Do you have any suggestions about how we can improve this course? If so please note them on the back of this paper.

If you studied the course online, did all the links work? If not please note the page and link on the back of this paper so we can fix it.
Instructions

Read the course material and enter your test answers on the one-page answer sheet included with this book.

You earn course credit for every test answer sheet with at least 80% correct answers. We notify failing students within 7 days and give them an opportunity to take a new test. There is no charge for a retest. To claim your credits, return your answers by:

- Return to our website (www.accesscontinuingeducation.com) to take the test online (only if you have not purchased the coursebook separately, you will need to provide credit card information at the time you submit your test online for scoring).
- Writing your answers on the one-page answer sheet included with this book, then fax or mail them to:

  Access Continuing Education, Inc. (ACE)
  P.O. Box 14585
  Albany, NY 12212
  Phone: 518-209-9540
  Fax: 518-514-1103

If you downloaded this coursebook from the Internet and are faxing/mailing your test answer sheet please include your credit card information for payment. Answer sheets received without payment will not be processed.

We grade all tests in a timely manner; so if you do not receive your certificate within five days, please send an email to accesseducation@nycap.rr.com.

There is no time limit for return of your answer sheet. Completion dates are taken from the test answer sheet envelope postmark or the finish date recorded in the computer when you do an online exam, and must be in the licensing cycle you wish to use the credits.

If you are dissatisfied with the course for any reason, please return the printed materials within 30 days of purchase and we will refund your full tuition. Shipping charges are nonrefundable.

If someone else would like to use this material after you are done, he or she may register with us and take advantage of the “sharing discount” workbook tuition charge. Courses downloaded from the Internet can be shared at the same tuition rate as currently available on our website. Please call us if you need an extra answer sheet or download one from our website. There is no “sharing discount” for online exams.

The author and Access Continuing Education, Inc. have made every effort to include information in this course that is factual and conforms to accepted standards of care. This course is not to be used as a sole reference for treatment decisions. It is your responsibility to understand your legal obligations and license requirements when treating patients. Access Continuing Education, Inc. is not responsible for the misuse of information presented in this course. The material in this course cannot be reproduced or transmitted in any way without the written consent of Access Continuing Education, Inc.
Table of Contents

Approvals 2
Instructions 6
Objectives 8
Introduction 8
Background Terminology 9
Epidemiology 10
Pathophysiology of Addiction 12
Classification & Characteristics of Psychoactive Substances 19
Treatment 31
Identification of the Abusing Patient 34
Implications for Dental Treatment 37
Impaired Oral Health Team Members 42
Conclusion 43
References 44
Appendix A: Glossary 46
Appendix B: Common Slang Terms 47
Appendix C: Online Resources 48
Appendix D: Treatment and Informational Related Resources 50
Appendix E: American Psychiatric Assoc. Diagnostic & Statistical Manual of Mental Disorders (DSM-IV-TR) 52
Appendix F: Schedules of Controlled Substances 52
Test 54
Objectives

Upon completion of this course, the dental professional will be able to:

- Identify epidemiological factors related to chemical dependency.
- Describe signs that may indicate that a patient is chemically dependent.
- List components of chemical dependency treatment.
- Discuss modifications in dental treatment that may be necessary when treating a patient who is chemically dependent or recovering from chemical dependency.
- Describe how drugs and alcohol may interact with dental therapeutic agents.

Introduction

Substance abuse occurs at an alarming rate in today’s society. An estimated 10.5 million Americans are affected by substance abuse (Bolton 2003). Though abuse of readily available drugs such as nicotine and alcohol remains constant, in recent years the misuse of prescription medications, particularly pain relief and cold medications such as Vicodin, Oxycontin, and Dextromethorphan, is on the rise. The most common substance abusing patients seen in a dental practice involves the use of alcohol, tobacco, sedative/hypnotics, barbiturates, and narcotics. Although the scope of dental practice does not include diagnosis or treatment of chemical dependency, the dental team must be aware of signs and symptoms of substance abuse and addiction. As health professionals we can provide education, early intervention, and provide motivation for the patient to seek help before abuse becomes dependency.

The dental professional's clinical role includes:

- Assistance in recognition of a substance abuse problem
- Relapse prevention for patients recovering from chemical dependency.
- Treatment modifications to ensure that each patient receives safe and effective dental care.

This course will also assist you in understanding:

- Prevalence and incidence of substance abuse.
- Pathophysiological and psychological features of substance abusers.
- Clinical manifestations of substance abuse.
- Treatment options available for substance abuse.
- Dental treatment modifications for patients who are abusing or recovering from substance abuse.
- Protocols if a member of the oral health team is impaired.
Background Terminology

This section will introduce you to a few key terms that will be used throughout the course. Words printed in **bold** text can be found in Appendix A.

Three important terms to remember:

- Substance Abuse
- Chemical Dependence
- Drug Addiction

These terms are often used interchangeably. And while related, it is important to know the differences in their core definitions.

**Substance abuse**
Substance abuse can be defined as "the use of a substance to modify or control mood or state of mind in a manner that is illegal or harmful to oneself or others". It is also defined as: the use of illegal drugs or the inappropriate use of legal drugs; or the repeated use of drugs to produce pleasure, to alleviate stress, or to alter or avoid reality (or all three) (NIH, 2005). Many times the term *substance abuse* is loosely defined and may take on a different meaning given the set of circumstances in which it is used. However, generally, the term refers to the **excessive use of drugs**.

**Chemical dependence**
Chemical dependence is a physical and psychological habituation to a mood- or mind-altering drug. The term is also used to describe the compulsive use of chemicals (such as drugs or alcohol) and the inability to stop using them despite all of the problems caused by their use. The illness is determined by genetic, physiological, biochemical, and emotional vulnerability (McElhiney, 2006).

**Drug addiction**
Drug addiction is a complex brain disease. It is characterized by compulsive, at times uncontrollable, drug craving, seeking, and use that persist even in the face of extremely negative consequences. Addiction involves the progression of acute drug use to the development of drug-seeking behavior, the vulnerability to relapse, and the decreased, slowed ability to respond to naturally rewarding stimuli. For many, drug addiction becomes chronic, with relapses possible even after long periods of abstinence (NIH, 2005).
Epidemiology

Epidemiology as it relates to substance abuse and dental patients can be loosely defined as the study of factors affecting the health and well-being of populations. The studies of such factors help to establish the foundations for identifying risk factors for disease and determining optimal treatment approaches. Studying statistics related to substance abuse within specific populations should give you a better understanding of your clientele base thus enabling more accurate diagnoses when determining chemical dependency in patients.

Prevalence

The prevalence of substance abuse within a population is defined as the number of individuals currently abusing drugs and/or alcohol. To measure prevalence, the National Survey on Drug Use and Health (NSDUH) is conducted annually by the Substance Abuse and Mental Health Service Administration (SAMHSA). This representative survey provides an estimate of the prevalence of illicit drug, alcohol, and tobacco use in the United States (U.S.). The sample population consists of non-institutionalized individuals age twelve or older. Although this survey gives a general description of drug and alcohol use in the U.S., it should not be used solely to judge individuals for risk of substance abuse (SDHHS, 2006).

For individuals 12 and older the most commonly used drugs in the United States are tobacco, alcohol, and caffeine. Nearly 37% of the male population and 23% of the female population currently use tobacco. Moreover, 52% of the population 12 and older currently use alcohol. With these statistics, a strong possibility is that many of the patients in your practice use either tobacco, alcohol, or both on a regular basis. The dental team must take the time to complete a proper history with each patient to determine if chemical dependency or substance abuse is an issue prior to treatment.

General Overview of statistics

- 8% of the population currently used illicit drugs in the 2009 NSDUH report
- Marijuana continues to be the most commonly used illicit drug with around 75% of all illicit drug users partaking in marijuana use. Of that 75% around 57% use marijuana exclusively.
- 21.8 million Americans age 12 years and older used illegal drugs in the past month up from 19.7 million in 2006. (September 2010, National Survey on Drug Use and Health). The US population was 307,006,550 according to the US Census Bureau in July 2009.
- An increase in the abuse of pain medications, like oxycodone (brand names such as Oxycontin, Percocet, Percodan, Tylox, and hydrocodone (Lortab, Vicodin, many other brand names.) is well documented.
Beginning in 2002, new items were added to the *2005 Monitoring the Future (MTF) Survey*, asking specifically about the use of OxyContin and Vicodin.

The most recent MTF report indicates significant downward trends in overall drug use among teenagers. In the 2009 MTF survey, cigarette usage is at the lowest rate in the history of the survey. Additionally, the use of illicit drugs has declined, particularly cocaine, methamphetamines, and hallucinogens. The one area of particular concern is the continued climb in the non-medical use of prescription drugs. Seven of the top ten drugs abused by 12th graders in the year prior to the survey were prescribed or purchased over the counter.

Many factors affect drug use and abuse. Age, gender, ethnicity, geography, education, and employment are among the top determining factors that contribute to the epidemiology of drug use. For example:

- Young adults, ages 18-25 are more likely to use illicit drugs than those younger or older.
- American Indians and Alaskan Natives have the highest rate of use among adults while Asians have the lowest rate.
- Men are more likely than women to use illicit drugs.
- Highest rates of drug use are on the Coasts. The Midwest and South remain the same.

All of these statistics and more can be found online at: http://www.drugabuse.gov and http://monitoringthefuture.org.

**Incidence**

Incidence is the frequency with which something, such as a disease, appears in a particular population or area. In disease epidemiology, the incidence is the number of newly diagnosed cases during a specific time period. The incidence is distinct from the prevalence which refers to the number of cases current on a specific day. The incidence of drug and alcohol abuse provides a useful measure of emerging patterns of substance abuse. These estimates are for 2008 NSDUH. In 2007, an estimated 2.7 million persons aged 12 or older used an illicit drug for the first time within the past 12 months; this averages to more than 7,000 initiates per day. As in years past, most initiates (60.1 percent) were younger than age 18 when they first used, and the majority of the new users were female. The average age at initiation among persons aged 12 to 49 was 18.0 years.
<table>
<thead>
<tr>
<th>Substance</th>
<th>New Users During 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>4.6 million</td>
</tr>
<tr>
<td>Prescription Drug Abuse</td>
<td>2.5 million</td>
</tr>
<tr>
<td>Cigarettes</td>
<td>2.2 million</td>
</tr>
<tr>
<td>Marijuana</td>
<td>2.1 million</td>
</tr>
<tr>
<td>Hallucinogens</td>
<td>1.1 million</td>
</tr>
<tr>
<td>Inhalants</td>
<td>775,000</td>
</tr>
<tr>
<td>Cocaine</td>
<td>906,000</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>157,000</td>
</tr>
<tr>
<td>Heroin</td>
<td>106,000</td>
</tr>
</tbody>
</table>

Pathophysiology of Addiction

The human body suffers significant changes which occur when a patient is suffering from addiction. **Pathophysiology** is the branch of medicine that deals with any disturbances of body functions, caused by disease or prodromal symptoms. The following section deals with the physiological aspects of addiction and how specific drugs affect the dental patient (US PH, SAMHSA 2006).

**Anatomy: Diagram of a Neuron**

An understanding of brain anatomy is the next important component of learning how the addiction process occurs. The brain is made up of millions of nerve cells, or **neurons**, which act as the body’s communication system. Neurons are made up of four basic parts, (a) the cell body, or soma, (b) dendrites, (c) an axon, or nerve fiber, and (d) axon terminals (Figure 1).
The cell body and dendrites are primarily responsible for receiving messages from other neurons. The axon is the transmitter, taking messages away from the cell body. The message transfer from the axon of one nerve cell to the dendrites of another nerve cell is called neurotransmission. When action potentials (or nerve impulses) reach axon terminals neurotransmitters are released. Neurotransmitters are chemical messengers of neurologic information released from a nerve cell, which thereby transmit an impulse from one nerve cell to another nerve, muscle, organ, or other tissue. Next, neurotransmitters diffuse across the synaptic cleft to bind with specific receptors on the dendrite of the message receiving’ neuron (US PH, SAMHSA 2006).

The neurotransmitter stimulates or inhibits an electrical response in the receiving neuron. It is important to appreciate that it is the receptor that dictates the neurotransmitter's effect.
More than forty neurotransmitters have been identified within the central nervous system. **Psychoactive** drugs can change the properties of neurotransmitter release, neurotransmitter reuptake, and the availability of receptor binding sites. Table 2 lists several neurotransmitters, their function and the drugs that affect them.
Table 2: Neurotransmitters and their function, NIDA, 2007

<table>
<thead>
<tr>
<th>Neurotransmitter</th>
<th>Distribution in the Central Nervous System</th>
<th>Functions Affected</th>
<th>Drugs That Affect It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dopamine</td>
<td>Midbrain, Ventral tegmental area (VTA), Cerebral cortex, Hypothalamus</td>
<td>Pleasure and reward, Movement, Attention, Memory</td>
<td>Cocaine, Methamphetamine, Amphetamine. In addition, virtually all drugs of abuse directly or indirectly augment dopamine in the reward pathway.</td>
</tr>
<tr>
<td>Serotonin</td>
<td>Midbrain, VTA, Cerebral cortex, Hypothalamus</td>
<td>Mood, Sleep, Sexual desire, Appetite</td>
<td>MDMA (ecstasy), LSD, Cocaine</td>
</tr>
<tr>
<td>Norepinephrine</td>
<td>Midbrain, VTA, Cerebral cortex, Hypothalamus</td>
<td>Sensory processing, Movement, Sleep, Mood, Memory, Anxiety</td>
<td>Cocaine, Methamphetamine, Amphetamine</td>
</tr>
<tr>
<td>Endogenous opioids (endorphin and enkephalin)</td>
<td>Widely distributed in brain but regions vary in type of receptors, Spinal cord</td>
<td>Analgesia, Sedation, Rate of bodily functions, Mood</td>
<td>Heroin, Morphine, Prescription painkillers (Oxycodone)</td>
</tr>
<tr>
<td>Acetylcholine</td>
<td>Hippocampus, Cerebral cortex, Thalamus, Basal ganglia, Cerebellum</td>
<td>Memory, Arousal, Attention, Mood</td>
<td>Herion, Morphine, Prescription painkillers (Oxycodone)</td>
</tr>
<tr>
<td>Endogenous cannabinoids (anadamide)</td>
<td>Cerebral cortex, Hippocampus, Thalamus, Basal ganglia</td>
<td>Movement, Cognition and memory</td>
<td>Marijuana</td>
</tr>
<tr>
<td>Glutamate</td>
<td>Widely distributed in brain</td>
<td>Neuron activity (increased rate), Learning, Cognition, Memory</td>
<td>Ketamine, Phencyclidine, Alcohol</td>
</tr>
<tr>
<td>Gamma-aminobutyric acid (GABA)</td>
<td>Widely distributed in brain</td>
<td>Neuron activity (slowed), Anxiety, Memory, Anesthesia</td>
<td>Sedatives, Tranquilizers, Alcohol</td>
</tr>
</tbody>
</table>
**Epidemiology**

Biological factors are that of cellular alteration. Change at the cellular level can lead to tolerance, dependence and eventually create withdrawal symptoms if the cellular affecting substance is no longer used. The National Institute of Drug Abuse provides extensive information on physiological aspects of addiction. Drug addiction results from adaptations in specific brain neurons caused by repeated exposure to a drug of abuse. These adaptations combine to produce the complex behaviors that define an addicted state.

The behavioral or environmental process of addiction holds that a person goes through specific behavioral stages when suffering from addiction (Table 3). According to Nakken, (1996) during Stages one and two it is possible for the individual to abstain from use of the drug. However, once the individual enters Stage three, it is nearly impossible for the addict to choose abstinence without intervention, treatment, and long-term after care.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Internal Change</td>
<td>Changes occur within the individual. May not be noticeable to others</td>
</tr>
<tr>
<td>2</td>
<td>Life Style Change</td>
<td>Lifestyle changes occur. Intoxication occurs often. May encounter consequences for use.</td>
</tr>
<tr>
<td>3</td>
<td>Life Breakdown Stage</td>
<td>Addicts want to stop but cannot. Suicide and accidental death more frequent.</td>
</tr>
</tbody>
</table>

**Brain Disease**

Drug addiction is a brain disease that develops over time as a result of the initially voluntary behavior of using drugs. The consequence is virtually uncontrollable compulsive drug craving, seeking, and use that interferes with, if not destroys, an individual's functioning in family and in society. Drugs are very powerful reinforcers, and even in conditions of limited access drugs, they can motivate high rates of favorable response by invoking what is known as the brain’s drug reward system. Perhaps the most powerful entity that can reinforce behavior is pleasure. The brain’s pleasure center, the ventral tegmental area (VTA), is part of the “survival center” of our brain. Although it is not the only brain system involved in giving a person the feeling of pleasure, the ventral tegmental system can be activated by both exogenous and endogenous stimuli. In addition to artificial stimulation through drugs, this system also offers natural rewards associated with eating and sexual and maternal...
behaviors. Once activated, the brain reward systems can produce a range of mood changes from slightly elevated to euphoric.

Addictive drugs can activate the VTA’s pleasure circuit in a powerful way, creating in the individual a strong desire to repeat the behavior (drug taking). If the individual continues to use the drugs, specifically psychoactive drugs, it is possible that the continued use may eventually alter neurons and their normal functions forever. This alteration causes the user to be less sensitive to "natural activators" of the reward system (e.g., sex and eating) thus leading the individual to take more drugs to get the stimulation he or she desires. Eventually, the individual will experience drug-seeking behavior (US PH, SAMHSA 2006).

![Brain diagram](image)

**Figure 3, (NIDA, 2006)**

*Models of Addiction and Alcoholism*

A report put out by the World Health Organization in 2004 states that *dependence* has not previously been recognized as a disorder of the brain, in the same way that psychiatric and mental illnesses were not previously viewed as being a result of a disorder of the brain. However, with recent advances in neuroscience, it is clear that dependence is as much a disorder of the brain as any other neurological or psychiatric illness. Addiction and Alcoholism are commonly misunderstood and are often not viewed as being disorders of the brain. In addition to neurological factors surrounding addiction and alcoholism, the role of biological, social, and environmental factors are known contributors to the disease process. Alcoholism and addiction are diseases involving biological, environmental, psychosocial, and spiritual factors, yet there is still doubt as to the validity of these diseases in the medical realm (Nakken, 1996).
Models for Addictions

*Moral Model*: Addictions are the result of human weakness, and are defects. Those who advance this model do not accept that there is any biological basis for addiction.

*Temperance Model*: Began with the prohibition movement in the late 19th century. The movement emphasized that the idea of moderation could not be relied upon as the key to treatment. Abstinence was asserted as the only alternative. The core assumption of the temperance movement was that the addictive and destructive power of the drug is strong and that it is the drug itself that is the problem.

*Disease Model*: Maintains that addiction is an illness, and comes about as a result of the impairment of healthy neurochemical or behavioral processes.

*The Genetic Model*: Proposes a genetic predisposition to certain behaviors. It is frequently noted that certain addictions "run in the family," and while researchers continue to explore the extent of genetic influence, there is strong evidence that genetic predisposition is often a factor in dependency.

**Signs and Factors of Addiction**
As health care professionals, it is important for the dental team to have the ability to recognize signs of addiction to identify a possibly chemically dependent patient.

<table>
<thead>
<tr>
<th>Table 4: Signs of Addiction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased consumption with increased tolerance</td>
</tr>
<tr>
<td>Increased desire for persistent and regular use of the drug</td>
</tr>
<tr>
<td>Loss of control, attempts to stop result in inability to stop and/or withdrawal</td>
</tr>
<tr>
<td>Continued use despite physical, psychological, social and legal ramifications</td>
</tr>
<tr>
<td>Compulsive drug-seeking behavior</td>
</tr>
<tr>
<td>Social Isolation</td>
</tr>
<tr>
<td>Suicidal thoughts and attempts</td>
</tr>
</tbody>
</table>
Factors that may play a role in making an individual susceptible to chemical dependency and addiction include:

**Biological Factors:**
- Genetics (heredity)
- Age
- Race/ethnicity
- Gender
- Route of administration (inhalation, oral, mucosal)

**Psychosocial Factors:**
- Family of Origin
- Education
- Occupation
- Cultural/religious

**Environmental Factors:**
- Availability of substance
- Peer pressure
- Media
- Substance abuse by family members
- Community environment (poverty, unemployment, crime
- Geographic location
- Legal ramifications

**Classifications & Characteristics of Psychoactive Substances**

Familiarity with commonly abused drugs may be helpful in evaluations with patients in your dental practice. This section provides a general description of several psychoactive substances including: depressants such as opiates, opioids, benzodiazepines, and barbiturates, stimulants including methamphetamine and others, hallucinogens, and inhalants.

The more quickly a drug gives a result, the more likely that substance is to lead to addiction. When prescribing medication to patients who have a history of substance abuse, choosing one with a longer onset of action may be better choice than to risk the more addictive, quicker onset of action medications.

**Central Nervous System Depressants**

CNS depressants include such drugs as alcohol, benzodiazepines, and barbiturates. These drugs slow nervous system activity and are used to produce sedation, treat pain, reduce anxiety and treat sleep disorders. These drugs have a high potential for abuse and tolerance to the drug develops quickly. These drugs are often abused in combination with alcohol (Nakken, 1996, Street Drugs.org 2006).
Alcohol
Alcohol reaches the bloodstream within five minutes of ingestion and is then carried to all parts of the body. Alcohol affects many neurotransmitter receptors and is believed to activate the pleasure/reward system of the brain. Alcohol is often abused in conjunction with other substances. Alcohol acts to affect other drug’s availability meaning that it may increase or decrease the activity and effectiveness of other drugs and may alter the drug into a toxic chemical that can damage the liver and other organs. These results can occur whether the drug is recreational or prescribed.

Some alcohol-drug interactions include antibiotics, anticoagulants, antidepressants, anti-diabetic medications, antihistamines, antipsychotic drugs, anti-seizure medications, narcotic and non-narcotic pain relievers, and cardiovascular medications.

- **Binge drinking** is defined as consuming more than five drinks or more on one occasion on one day within the past thirty days. This typically happens when men consume 5 or more drinks, and when women consume 4 or more drinks, in about 2 hours (Little, Falace, Miller, and Rhodus, 2002).

- **Moderate drinking** is defined as two drinks per day for males and one drink per day for females. A drink is defined as a 12-ounce beer or wine cooler or five ounce glass of wine or 1.5 ounces of distilled liquor. (Street Drugs, p 77)

Barbiturates (e.g., Amytal, Phenobarbital, Seconal, Nembutal) are used to treat anxiety, insomnia, and as an anticonvulsant. These drugs produce effects similar to alcohol. These drugs enhance GABA receptors, which inhibit CNS activity. They do not reduce sensations of pain. Medical use of barbiturates has decreased with the introduction of benzodiazepines.

Benzodiazepines (e.g., Valium, Xanax, Ativan, and Halcion) are often abused by both adolescents and adults. These drugs are most commonly used in the treatment of panic disorders with or without agoraphobia, anxiety disorders or for short-term relief of symptoms of anxiety including anxiety associated with depression, and prevention of seizures. Dental patients who abuse or are dependent may complain of TMJ pain or fear of dental treatment. Patients who abuse or are addicted to stimulant drugs may also seek sedatives to abate withdrawal from such drugs as cocaine and methamphetamine. Withdrawal from this drug group can be lethal and should be done under a physician’s direction. Alcohol heightens the effects of these drugs and can lead to lethal overdose.

Rohypnol (brand name for flunitrazepam), while illegal in the United States, this is a legal drug in many countries and is used to treat sleep and psychiatric disorders. This drug is commonly taken with other drugs (heroin, cocaine and alcohol) and is ten times stronger than Valium. Rohypnol has
become increasingly popular because it is easy to obtain and relatively inexpensive. It is also known as “the date rape drug” because men have been known to drop it into women’s drinks causing them to black out and thereby creating a potential rape situation. If given a sufficient dose (2-mg), the woman will have no recollection of events occurred while under the influence.

**Ketamine** is used in veterinary medicine. It produces a disassociated state and impaired perception and has both analgesic and amnesic properties. With the use of this drug there is no depression of the CNS, but there can be depressed respiratory function. Ketamine goes by the street name “Special K” and has been used in cases of sexual assault.

<table>
<thead>
<tr>
<th>Table 5: CNS Depressants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Effects</strong></td>
</tr>
<tr>
<td>• Slow down nervous system activity</td>
</tr>
<tr>
<td>• Decrease anxiety</td>
</tr>
<tr>
<td>• Drowsiness</td>
</tr>
<tr>
<td>• Relax muscles</td>
</tr>
<tr>
<td>• Sedation</td>
</tr>
<tr>
<td>• Dilated blood vessels</td>
</tr>
<tr>
<td>• Dilated pupils</td>
</tr>
<tr>
<td><strong>Method(s) of Administration</strong></td>
</tr>
<tr>
<td>• Ingested</td>
</tr>
<tr>
<td>• Injected</td>
</tr>
<tr>
<td>• Smoked</td>
</tr>
<tr>
<td>• Snorted</td>
</tr>
<tr>
<td><strong>Withdrawal Symptoms</strong></td>
</tr>
<tr>
<td>• Seizures</td>
</tr>
<tr>
<td>• Hallucinations</td>
</tr>
<tr>
<td>• Tremors</td>
</tr>
<tr>
<td>• Agitation</td>
</tr>
<tr>
<td>• Irritability</td>
</tr>
<tr>
<td>• Sweating</td>
</tr>
<tr>
<td>• Anxiety</td>
</tr>
</tbody>
</table>

**Opioids and Opiates (Narcotics)**

Opioids are a synthetic form of opiates and include Darvocet, Vicodin, Dilaudid, Demerol, Percocet, Oxycontin, and Fentanyl. Opioids are commonly prescribed for the relief of dental pain due to their effective analgesic, or pain relieving, properties. Studies have shown that properly managed medical and dental use of opioid analgesic compounds is safe and rarely causes addiction. Taken exactly as prescribed, opioids can be used to manage pain effectively (Nakken, 1996, ASAM, 2007).
**Hydrocodone** is one of the most abused prescription drugs. It is not uncommon for patients who are addicted to opioids to feign dental pain in an effort to get a prescription. This is one example of substance abuse and drug seeking behavior.

**Fentanyl** is a potent opioid drug 80-100 times more potent than morphine. This drug is commonly used during surgery and may lead to addiction and even death of health care workers who have access to it. Because Fentanyl is used for chronic pain, it has been formulated into a “lolli-pop” specifically intended for use by chronic pain patients. Several narcotics are now available in transdermal patches and are also intended for management of chronic pain. Abuse of both these patches and “lolli-pops” by both teens and adults is increasing at alarming rates.

The opiate class includes such drugs as opium, codeine, morphine, and heroin. Opium, codeine and morphine can be extracted directly from the opium plant. Heroin is the most addictive opiate known because it penetrates the brain the fastest. There is no therapeutic use for heroin. There has been an increase in the use of heroin in the past few years to the modification of heroin into a more pure form that can be smoked or ingested rather than injected intravenously.
<table>
<thead>
<tr>
<th><strong>Table 6: Opiates &amp; Opioids (Narcotics)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action &amp; Use</strong></td>
</tr>
<tr>
<td>These drugs (along with amphetamines and cocaine) offer the most powerful activation of the drug reward system. Activation of opiate receptors in the brain produces sensations of pleasure (reward) and pain relief (analgesic). Opiates may also be used as antidiarrheal and <strong>antitussive</strong> agents.</td>
</tr>
<tr>
<td><strong>Method(s) of Administration</strong></td>
</tr>
<tr>
<td>• Oral (ingested and transmucosal)</td>
</tr>
<tr>
<td>• Snorted</td>
</tr>
<tr>
<td>• Smoked</td>
</tr>
<tr>
<td>• Injected (increased risk of hepatitis, HIV and blood poisoning)</td>
</tr>
<tr>
<td><strong>Effects</strong></td>
</tr>
<tr>
<td>• Vomiting</td>
</tr>
<tr>
<td>• Drowsiness</td>
</tr>
<tr>
<td>• Depressed respiration</td>
</tr>
<tr>
<td>• Constricted (pinpoint) pupils</td>
</tr>
<tr>
<td><strong>Prolonged Use/Abuse</strong></td>
</tr>
<tr>
<td>• Physical and psychological dependence</td>
</tr>
<tr>
<td>• Constipation</td>
</tr>
<tr>
<td>• Congested lungs</td>
</tr>
<tr>
<td>• Peptic and duodenal ulcers</td>
</tr>
<tr>
<td>• Diabetes</td>
</tr>
<tr>
<td>• Liver disease*</td>
</tr>
<tr>
<td>• Death</td>
</tr>
<tr>
<td>*narcotics pain relievers are commonly made with acetaminophen; abuse of these drugs expose the user to prolonged doses of acetaminophen</td>
</tr>
<tr>
<td><strong>Withdrawal Symptoms</strong></td>
</tr>
<tr>
<td>(Usually begin within 24 hours after the last use and may last up to 10 days)</td>
</tr>
<tr>
<td>• Yawning</td>
</tr>
<tr>
<td>• Diarrhea</td>
</tr>
<tr>
<td>• Runny, itchy nose</td>
</tr>
<tr>
<td>• Uneasiness</td>
</tr>
<tr>
<td>• Weight loss</td>
</tr>
<tr>
<td>• Abdominal cramps</td>
</tr>
</tbody>
</table>

**Dextromethorphan**

News reports have addressed the abuse of DMX found in over the counter (OTC) cough depressants. At the doses recommended for treating coughs (1/6 to 1/3 ounce of medication, containing 15 mg to 30 mg dextromethorphan), the drug is safe and effective. At much higher doses (4 or more ounces), dextromethorphan produces dissociative effects similar to those of PCP and ketamine. One slang term for DMX use is “skittling” since pills resemble Skittles candy. Additionally a “Robo shake is described as drinking large amounts of cough syrup, followed by inducing vomiting so as to absorb DMX through the stomach lining to achieve desired effects.
Central Nervous System Stimulants

Cocaine, amphetamines, methamphetamines, nicotine and even caffeine stimulate brain and/or spinal cord activity. The physiologic process for each drug is slightly different, but the outcome is similar. These substances (along with opiates and opioids) powerfully activate the brain’s reward system and decrease the rewarding effect of normal behavior.

Action & Use

Cocaine prevents the reabsorption of dopamine, which results in intense feelings of pleasure. Effects occur within a few minutes and disappear within an hour. Because of its immediate effects, and short duration of pleasure, the user continuously needs to take the drug, making cocaine highly addictive.

Crack is an even more addictive form of cocaine. Unlike cocaine, the effects of crack only last a few minutes and many users become addicted after their first use of the drug.

Amphetamines may be used medically to treat attention deficit disorders (ADD) and obesity in addition to other conditions. They are also used to avoid sleep and improve performance. Amphetamines operate by altering the amount of neurotransmitters in the brain.

Methamphetamine initially causes release of dopamine and norepinephrine from their storage vesicles in the neuron. Once released, methamphetamine prevents the breakdown of dopamine and norepinephrine within the nerve cell. The excess of neurotransmitters is then carried into the synapse. Increased, synaptic concentrations of dopamine cause feelings of euphoria, while excess norepinephrine may be responsible for the alertness and anti-fatigue effects of methamphetamine.

Nicotine is only found in the tobacco plant. Nicotine stimulates acetylcholinergic receptors located in the pleasure center of the brain. Nicotine is highly addictive.

Caffeine, the most widely used stimulant, inhibits an enzyme that acts as a messenger for several neural transmission systems including norepinephrine. It does not ordinarily pose a threat to health unless consumed in massive quantities over time.

Adderall®, a single-entity amphetamine product, was introduced in 1996 as instant-release tablets, which have since become available as the generic formulation "mixed amphetamine salts." The active ingredients of Adderall include a combination of dextroamphetamine and racemic amphetamine salts. The sale of Adderall XR has been suspended in Canada due to fatalities related to its use. Reports of
misuse by children and teens include crushing the drug and snorting or smoking the resulting powder (NIH, 2007).

Ritalin® (methylphenidate hydrochloride), Concerta® (methylphenidate hydrochloride), and Strattera®, (atomoxetine hydrochloride) are other drugs commonly prescribed to children to control attention deficit disorder (ADD).

<table>
<thead>
<tr>
<th>General Effects</th>
<th>Table 7: CNS Stimulants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Increase nervous system activity</td>
</tr>
<tr>
<td></td>
<td>• Increase heart rate and blood pressure</td>
</tr>
<tr>
<td></td>
<td>• Increase gastric and adrenal secretions</td>
</tr>
<tr>
<td></td>
<td>• Nausea, vomiting, diarrhea</td>
</tr>
<tr>
<td></td>
<td>• Xerostomia</td>
</tr>
<tr>
<td></td>
<td>• Headache</td>
</tr>
<tr>
<td></td>
<td>• Fever</td>
</tr>
<tr>
<td></td>
<td>• Loss of coordination</td>
</tr>
<tr>
<td></td>
<td>• Mood swings</td>
</tr>
<tr>
<td></td>
<td>• Loss of appetite</td>
</tr>
<tr>
<td></td>
<td>• Dilated pupils</td>
</tr>
<tr>
<td></td>
<td>• Long periods without sleep (24-120 hours) followed by long periods of sleep (24-48 hours)</td>
</tr>
<tr>
<td>Method(s) of Administration</td>
<td>(methamphetamine)</td>
</tr>
<tr>
<td>Snorted</td>
<td></td>
</tr>
<tr>
<td>Smoked</td>
<td></td>
</tr>
<tr>
<td>Injected</td>
<td></td>
</tr>
<tr>
<td>Ingested</td>
<td></td>
</tr>
<tr>
<td>Rubbed into gums</td>
<td></td>
</tr>
<tr>
<td>Rectal insertion</td>
<td></td>
</tr>
<tr>
<td>Withdrawal Symptoms</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td></td>
</tr>
<tr>
<td>Severe hunger</td>
<td></td>
</tr>
<tr>
<td>Exhaustion</td>
<td></td>
</tr>
<tr>
<td>Mental Symptoms</td>
<td></td>
</tr>
<tr>
<td>Paranoia</td>
<td></td>
</tr>
<tr>
<td>Anxiousness</td>
<td></td>
</tr>
<tr>
<td>Nervousness</td>
<td></td>
</tr>
<tr>
<td>Agitation</td>
<td></td>
</tr>
<tr>
<td>Extreme Mood Swings</td>
<td></td>
</tr>
<tr>
<td>Hallucinations</td>
<td></td>
</tr>
<tr>
<td>Delusions</td>
<td></td>
</tr>
</tbody>
</table>

Hallucinogens (Psychedelics)

These drugs can cause an altered state of perception and distortion of reality. There is no physical or psychological need to repeat drug use, but individuals often desire to repeat the experience. Hallucinogens have no medical purpose and can be man-made or grown naturally (Nakken, 1996, ASAM, 2007).
Action & Use
The effect hallucinogens have on brain chemistry varies depending on the substance. Generally, these substances activate serotonin receptors to the point that excess dopamine may be released.

LSD (Acid) is produced from a fungus that grows on grain, especially rye. It produces widespread hallucinogenic effects by binding with serotonin receptors causing greatly increased activation.

MDMA (Ecstasy), is a synthetic drug similar to methamphetamine that causes an increase in the release of serotonin and dopamine. This drug is believed to permanently destroy serotonin receptors. (See Appendix B) http://www.nida.nih.gov/infofacts/ecstasy.html

PCP is not considered a true hallucinogen, but is included in this group due to the similar effects it has on the body compared with hallucinogenic drugs. Though it may affect the body similarly in many ways it rarely produces hallucinations. PCP alters body perception and may mimic symptoms of schizophrenia. Long-term use may cause permanent memory loss and difficulty with speech.

Salvinia divinorum is an herb common to southern Mexico and Central and South America. The main active ingredient in Salvia, salvinorin A, is a potent activator of kappa opioid receptors in the brain. It is usually smoked and causes a dissociative or hallucinogenic episode lasting less than 30 minutes.

<table>
<thead>
<tr>
<th>Table 8: Hallucinogens</th>
</tr>
</thead>
</table>
| **General Effects**    | • Visual and/or auditory distortions  
                          • Rapid emotional swings  
                          • Delusions  
                          • Sexual dysfunction  
                          • Decreased muscle coordination  
                          • May develop chronic mental disorders following long term use |
| **Method(s) of Administration** | • Injected  
                          • Ingested  
                          • Swallowed (e.g., paper soaked with LSD)  
                          • Ocular (LSD dropped into eyes with an eyedropper)  
                          • Smoked  
                          • Sniffed |
| **Withdrawal Symptoms** | Although psychological dependence is likely, no withdrawal symptoms occur when use is discontinued. |
**Cannabis (Marijuana)**

Marijuana is the most commonly abused illicit drug in the United States. It is a dried shredded green and brown mix of flowers, stems, seeds, and leaves of the cannabis sativa plant. The main active chemical in marijuana is delta-9-tetrahydrocannabinol (THC). Marijuana cigarettes contain more of the known carcinogen, benzopyrene, than tobacco cigarettes. Considered a gateway drug in that an individual is likely to begin experimentation with other illicit drugs once he or she has tried marijuana. In recent years the THC content of marijuana has increased from approximately one percent in 1974 to 6-33% today. (SD page 69).

**Action & Use**

Once ingested, THC binds to cannabinoid receptors and interferes with the part of brain that is responsible for muscle movement, sensory perception, and memory. While Marijuana is an illegal drug, THC has been used in prescription form to counteract the nausea an individual may experience while undergoing chemotherapy, provide relief from glaucoma, stop convulsions, reduce muscle spasms, and stimulate appetite. The use of marijuana for medical purposes is a highly controversial issue and the addictive potential of marijuana continues to be under debate.
### Table 9: Cannabis

<table>
<thead>
<tr>
<th>Effect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Effects</td>
<td>• Increased pulse rate</td>
</tr>
<tr>
<td></td>
<td>• Bronchial passages relax and expand</td>
</tr>
<tr>
<td></td>
<td>• Blood vessels of eyes dilate</td>
</tr>
<tr>
<td></td>
<td>• Xerostomia</td>
</tr>
<tr>
<td></td>
<td>• Increased appetite</td>
</tr>
<tr>
<td></td>
<td>• Apathy</td>
</tr>
<tr>
<td></td>
<td>• Impaired immune symptoms</td>
</tr>
<tr>
<td></td>
<td>• Confusion</td>
</tr>
<tr>
<td></td>
<td>• Impaired coordination</td>
</tr>
<tr>
<td></td>
<td>• Increased risk of lung cancer, chronic bronchitis</td>
</tr>
<tr>
<td></td>
<td>• Impaired memory (temporary and permanent)</td>
</tr>
<tr>
<td>Method(s) of Administration</td>
<td>• Smoked</td>
</tr>
<tr>
<td></td>
<td>• Oral ingestion</td>
</tr>
<tr>
<td>Withdrawal Symptoms</td>
<td>• Irritability</td>
</tr>
<tr>
<td></td>
<td>• Sleeplessness</td>
</tr>
<tr>
<td></td>
<td>• Anxiety</td>
</tr>
<tr>
<td></td>
<td>• Increased aggression has been displayed peaking approximately one week after the last use of the drug</td>
</tr>
</tbody>
</table>


“Spice” is used to describe a diverse family of herbal mixtures marketed under many names, including K2, fake marijuana, Yucatan Fire, Skunk, Moon Rocks, and others. These products contain dried, shredded plant material and presumably, chemical additives that are responsible for their psychoactive (mind-altering) effects. It may appear in the form of potpourri with a warning “not for human consumption.” It is usually smoked and may appear as incense. Five forms are now Schedule 1 drugs in the United States.

**Inhalants**

Inhalants are a diverse group of volatile substances whose chemical vapors can be inhaled to produce psychoactive (mind-altering) effects. While other abused substances can be inhaled, the term “inhalants” is used to describe substances that are rarely, if ever, taken by any other route of administration. Inhalants are a diverse group of substances whose chemical vapors can be inhaled to produce psychoactive effects. While it is true that other abused substances can be inhaled, the term
“inhalants” is often used to describe substances that are rarely taken by another route of administration. Because many of the most common inhalants are available in the household, they are often among the first drugs used by children and teens. One national survey indicates that about 3 percent of U.S. children have tried inhalants by the time they reach fourth grade (USDHHS, 2011). Today 46 states have induced legislation to prevent sell of inhalants to minors.

Actions & Use

Most inhalants slow down body function yet the individual user may, depending on dosage levels, feel stimulated. Inhalants affect both the Central Nervous System (CNS) and the peripheral nervous system (PNS). Inhalants are attracted to fatty tissues within the body leading to the absorption of the chemical agent into myelin (fatty tissue surrounding the nerve axon). The result of this absorption may lead to polyneuropathy. As described later in this section, inhalants are often used for legitimate medical purposes. Medical/Dental uses of inhalants include nitrous oxide (conscious sedation) and amyl nitrite (treatment of angina pectoris). Interestingly, individuals do not develop a tolerance to inhalants as when an individual continues use and doses are increased, immediate death is very likely. Users may suffer asphyxia, suffocation, choking on their own vomit, or sudden sniffing death syndrome (SSD). SSD is the result of a sudden and unexpected disturbance of the heart's rhythm. All inhalants, including nitrous oxide, can produce SSD.

Volatile solvents - (Paint thinners, gasoline, glue, cleaning solutions, nail polish, etc.) Commonly found in the workplace, home and at school, volatile solvents contain toluene. Vital organs rapidly absorb and store toluene, causing serious tissue damage and alteration. SSD caused by cardiac arrhythmia can also occur. Serious burn injury is common due to the highly flammable nature of these substances.

Aerosols - (Spray paint, hairspray, air fresheners, lighter fluid, etc.) Individuals abusing these substances risk permanent damage to vital organs and SSD due to the likelihood of cardiac arrhythmia and pulmonary collapse during or after use.

Nitrous oxide - Nitrous oxide mixed with oxygen provides effective analgesia for dental and medical procedures. Nitrous oxide is also used as a propellant for whipped cream and as a source of injected oxygen in the automotive industry. Nitrous oxide is easily procured at restaurant supply stores and specialty coffee shops. In these situations, the abuser uses the nitrous oxide cartridges in what is referred to as a “whippet.” A "high" can be reached in less than 30 seconds when inhaling 50 to 75 percent nitrous oxide. In the incidents where users attempt to achieve a higher state of euphoria by
breathing higher concentrations or pure N\textsubscript{2}O, usually by placing their head inside an N\textsubscript{2}O filled plastic bag, deaths are common.

The Compressed Gas Association, OSHA, and NIOSH are just a few of the reputable agencies that provide information on how to protect personnel from accidental exposure and how to prevent nitrous oxide abuse in the dental practice setting. (See Appendix D)

**Nitrites** - Amyl nitrite (poppers) was once used to treat angina pectoris. Nitrites are most often abused to enhance sexual experiences. Combining “popper” use with Viagra is very dangerous and has been reported with subsequent deaths (Nakken, 1996).

Studies have linked the chronic abuse of solvents to severe, long-term damage to the brain, the liver, and the kidneys. Harmful irreversible effects that may be caused by abuse of specific solvents include:

- **Hearing loss** - toluene (spray paints, glues, dewaxers) and trichloroethylene (dry-cleaning chemicals, correction fluids)
- **Peripheral neuropathies, or limb spasms** - hexane (glues, gasoline) and nitrous oxide (whipped cream dispensers, gas cylinders)
- **Central nervous system or brain damage** - toluene (spray paints, glues, dewaxers)
- **Bone marrow damage** - benzene (gasoline)
Table 10: Inhalants

| General Effects                                    | • Loss of appetite               |
|                                                  | • Dizziness                      |
|                                                  | • Slurred Speech                 |
|                                                  | • Halitosis                      |
|                                                  | • Eye Irritation                 |
|                                                  | • Headache                       |
|                                                  | • Tinnitus                       |
|                                                  | • Chest pain                     |
|                                                  | • Muscle weakness                |
|                                                  | • Permanent damage to nervous system |
|                                                  | • Brain, liver, kidney, blood and bone marrow damage |
| Peri-oral signs                                  | • Chemical burns and/or sores around nose and mouth |
|                                                  | • Colored areas (paint and other inhalants around nose and mouth) |
| Method(s) of Administration                      | • Inhaling                       |
|                                                  | • Bagging (inhaling fumes from a plastic bag or balloon) OR placing bag over head and releasing inhalant |
|                                                  | • Huffing (stuffing an inhalant soaked rag into the mouth) |
| Withdrawal Symptoms                               | Although psychological dependence is likely, no withdrawal symptoms occur when use is discontinued. |

Treatment

Perhaps the most complex aspect of substance abuse or addiction lies in identifying treatment options. While treatment is desirable, the individual who requires treatment must be a willing participant. Keep an updated list of a variety of local drug treatment organizations and appropriate contact information for those patients identified as having a problem, and who is willing to seek treatment. Confidentiality must be maintained and a non-judgmental attitude cultivated.

Stages of Treatment

Prochaska, DiClemente and Norcross have studied the process of change known as the Transtheoretical Model of Change or TTM. (USPHS, NIH, NIDA 2006) TTM assesses an individual’s readiness to act on a new healthier behavior and provides strategies or processes of change to guide the individual through the stages of change to action and maintenance. Although this change model
was originally designed for smoking cessation it is known as the dominant model of health behavior change, and is applicable to any form of substance abuse.

The six stages of change in the TTM model include:

1. **Precontemplation stage** - an individual may be unaware of a problem and is aware, has no intention of changing.
2. **Contemplation stage** - an individual devotes serious thought to overcoming the problem but has not yet committed to any action.
3. **Preparation stage** - an individual plans to take action within a certain time frame.
4. **Action stage** - an individual is successful in modifying their behavior.
5. **Maintenance stage** - an individual continues to change and takes action to prevent relapse. An individual who has been drug free post-6 months to 5 years is considered in this stage.
6. **Relapse** - recovery from addiction is considered a continuous process rather than a discrete event. By definition, relapse is expected in and defined as, a criterion for chemical dependency and addiction.

An understanding of user stages assists in effective communication with the patient. Pre-contemplators have no interest in changing behavior and are also known as contented users. Remember that you must never be judgmental or critical as outside influence is at its peak during the Contemplative and Maintenance phases.

There are several components and combinations of care commonly offered to individuals seeking or requiring treatment for substance abuse, dependency and addiction.

Options may include:

- Detoxification programs
- Intensive treatment
- Residential programs
- Outpatient services
- Pharmacotherapy (Antabuse®, Methadone®, naltrexone, bupernorphrine, Chantix®, nicotine replacement products,)
- Aftercare
- Maintenance
- Education
- Adjunctive services
- Combination of above listed treatment modalities
Non-traditional treatments may include:

- Self-help groups (Alcoholics Anonymous, Narcotics Anonymous, Cocaine Anonymous, Rational Recovery etc.)
- Controlled or moderated drinking
- Acupuncture
- Biofeedback

**Behavioral Treatments:** Patients engage in the treatment process, modify their attitudes and behaviors related to drug abuse, and increase healthy life skills.

**Pharmacotherapy:** Initially, pharmacotherapies for substance abuse were aimed at controlling withdrawal symptoms and deterring relapse. Some of the more common drugs used in pharmacotherapy include Buprenorphine, methadone, Naltrexone, and Chantix. Dental clinicians must understand the effects of different agents used in pharmacotherapy, and the interaction with common drugs used in dental treatment.

**Buprenorphine:** A relatively new and important treatment medication used in pharmacotherapy. NIDA-supported basic and clinical research has led to the development of buprenorphine (Subutex or, in combination with naloxone, Suboxone), and has demonstrated it to be a safe and acceptable addiction treatment commonly used for opioid addiction. While these products were being developed in concert with industry partners, Congress passed the Drug Addiction Treatment Act (DATA 2000), permitting qualified physicians to prescribe narcotic medications (Schedules III to V) for the treatment of opioid addiction. This legislation created a major paradigm shift by allowing access to opiate treatment in a medical setting rather than limiting it to specialized drug treatment clinics (USPHS, NIH, NIDA 2006).

**Methadone:** A synthetic narcotic commonly used in the treatment of narcotic addiction. Methadone is usually taken once per day and can almost completely block the euphoric effect of heroin. The downside of this pharmacotherapy drug is that individuals can become addicted to the Methadone.

**Naltrexone:** (Depade®, ReVia®) may also be useful in treating alcoholics. There is now an injectable long-acting form of naltrexone (Vivitrol®) available for treatment. The medication acts in the brain to reduce craving for alcohol after someone has stopped drinking.

**Acamprosate** (Campral®) is now commonly used in the treatment of alcoholism. It is thought to work by reducing symptoms that follow lengthy abstinence, such as anxiety and insomnia (Prochaska, DiClemente, & Norcross, 1992).
**Chantix**: (varenicline) is used in conjunction with nicotine replacement therapy and behavioral counseling has been scientifically evaluated and shown to increase success among individuals seeking to cease smoking. According to Gonzales et al., varenicline was significantly more effective than placebo for smoking cessation throughout the entire study and significantly more successful than bupropion SR at the end of twelve weeks of drug treatment and again at twenty-four weeks (USPHS, NIH, NIDA 2006).

A once commonly used medication for treatment of alcoholism, disulfiram (Antabuse®), is infrequently used today. It does not block cravings but discourages drinking by causing a patient to feel sick after drinking alcohol.

**Identification of the Abusing Patient**

Understanding the general nature of chemical abuse, dependency, and addiction is critical for any oral health team member. Dental professionals are responsible for recognizing drug-abusing behavior and clinical manifestations of substance abuse and dependency. Every member of the oral health team needs to understand how a patient's substance use or abuse impacts dental care.

There are many implications for oral health professionals in identifying and managing the client who is abusing illegal substances. Management issues include identification of potential drug interactions, consideration of to offer cessation information to receptive patients, and dealing with the possible erratic behavior of a patient currently under the influence of drugs or who presents a pattern of drug seeking behavior during dental treatment.

**Screening Methods**

Screening for substance abuse is typically a brief verbal interaction that brings focus to the potential harm substance use brings to the quality of dental care. The dental professional will mostly likely rely on observation of behavior, physical findings, and verbal or written tests to aid in identification of substance abusers.

**Written Assessments**

There are a number of written questionnaires available to determine substance abuse and use. The Drug Abuse Screening Test or DAST is a twenty-question self-test that does not include alcohol, but is otherwise comprehensive in its questions. Studies show that DAST is perhaps the most widely used questionnaire relating to screening for substance abuse. Tests that deal specifically with alcohol abuse include the **CAGE Questionnaire** and the Michigan Alcohol Screening Test or MAST. CAGE consists of four questions, if two are answered positively, the individual taking the test is said to have issues with alcohol abuse.\(^{18}\) MAST is a more comprehensive test consisting of twenty-two questions
designed to provide a rapid and effective screening for lifetime alcohol-related problems and alcoholism. Examples of these tests can be found at http://counsellingresource.com.

NIDA suggest the following screening questions to be used with adolescent patients:

- Have you ever ridden in a car driven by someone (including yourself) who had been using alcohol or drugs?
- Do you ever use alcohol or drugs to relax, feel better about yourself, or fit in?
- Do you ever use alcohol or drugs when you are alone?
- Do you ever forget things you did while using alcohol or drugs?
- Does your family or friends ever tell you to cut down on your drinking or drug use?
- Have you ever gotten into trouble while you were using alcohol or drugs?

These written screening tools are not generally used in the private dental practice settings.

**Health History**

Questions regarding current or previous drug and alcohol use (legal or illicit) should be included in the dental health history questionnaire. The American Dental Association is a good resource for such form (Gonzales, Rennard, Nides, et al. 2006). It is important to reassure patients that honest responses are both kept confidential and are necessary to in order to provide the best oral health care possible, particularly when the patients is reluctant to respond. When patients sign HIPAA documents upon arrival, it may be beneficial for the office manager or receptionist to reiterate this to the patient as well.

Examples of questions that can be included in a dental health questionnaire:

- Please list all prescription and nonprescription drugs/medications you are currently taking.
- Have you taken any prescription or nonprescription drugs/medications within the past 48 hours?
- Do you consume alcoholic beverages?
  - Type?
  - Frequency
- Do you use tobacco products?
  - Type
  - Frequency
- Are you interested in quitting?
- Are you currently undergoing treatment for alcohol or drug addiction?
- Have you ever been treated for alcohol and/or drug addiction?

Verbal questioning should be handled in a private, non-threatening environment to ensure patient confidentiality. An empathic and nonjudgmental style is critical to gathering accurate information regarding drug and alcohol use. The dental professional should convey confidence in the patient’s ability to be responsible for their drug and alcohol use. Reinforce your willingness to help and monitor alcohol, tobacco, and drug use at future visits.
**Physical Assessment**

Certain drug and alcohol-related behaviors may help identify the substance-abusing patient. Alcohol and most other drugs produce intraoral signs and symptoms. Even though a patient may show one or more of the symptoms mentioned below, it does not necessarily mean that he or she is using drugs. Some of these symptoms could be the product of stress, depression, or a host of other issues. As a healthcare professional you must remain open minded.

**Signs and Symptoms of Substance Abuse**

**Behavioral:** Changes in work habits such as absenteeism, tardiness, inattention to detail, mood swings, decline in personal hygiene, social isolation, and apathy may appear (USPHS, NIH, NIAAA 2007).

**Cognitive and Psychomotor Function:** Inability to recall information, slurred speech, uncoordinated body movement, changes in handwriting and instrumentation* (*impaired professional).

**Physiological Changes:** The particular physiological changes associated with drug use and dependence vary depending on the type of drug. Because of the extensive research, please refer back to the section on Classification and Characteristics of Psychoactive Substances for specific details.
Table 11 is a modified version of The National Institute on Alcohol Abuse and Alcoholism’s screening and intervention procedures.

<table>
<thead>
<tr>
<th>Table 11: Screening and Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASK about drug and alcohol use</strong></td>
</tr>
<tr>
<td><strong>ASSESS for drug and alcohol related problems</strong></td>
</tr>
<tr>
<td><strong>ADVISE and ASSIST</strong></td>
</tr>
<tr>
<td><strong>At Follow-up: Continue Support</strong></td>
</tr>
</tbody>
</table>

**Implications for Dental Treatment**

Healthcare providers must be educated to recognize the signs and symptoms of substance abuse. Patients are rarely completely honest about drug and alcohol use and abuse. When treating patients who are either recovering from substance abuse, or are currently abusing, it may be necessary to modify treatment. Keep in mind that patients, who have been through treatment and are in recovery may be apprehensive about spending time in an environment that may lead to relapse. Consultation with the patient’s physician or primary care provider is advised.

The most common drug interactions in dentistry involve tobacco and/or alcohol. While tobacco and nicotine affect oral health more directly, alcohol use puts a patient at higher risk for complications when used in conjunction with common prescription medications. Of the twenty most prescribed drugs, over 50% have at least one ingredient that will negatively react with alcohol (ADA, 2006).

**Alcohol:** As a dentist, you must approach patients who abuse alcohol but do not suffer from alcoholic liver disease (ALD) very differently when considering dental treatment modifications. Patients who suffer from anxiety or fear of dental treatment commonly self-medicate with alcohol to
decrease the anxiety prior to their appointment. The oral health team member’s role is to discourage this practice by explaining how we are prepared to decrease anxiety through safer techniques such as use of behavior modification and/or pharmacotherapy.

The patient with ALD presents challenges during dental treatment. Elective dental treatment is not recommended for patients who suffer from acute ALD and who are not receiving medical treatment. Patients with from ALD have three major dental treatment issues:

1. Bleeding tendency
2. Unpredictable metabolism of certain drugs
3. The risk of the spread of infection

**Bleeding Tendencies:** Since the liver is a primary source for agents involved in clotting, ALD patients should have a complete blood count with differential, AST and ALT, prothrombin time and platelet count checked prior to treatment. If treatment will involve excessive bleeding, local hemostatic agents should be used, and treatment avoided if an acute drinking episode has occurred within the last four to five days (McKee, Falba, O’Malley, et al. April 2007).

**Unpredictable Metabolism:** Increased amount of local anesthetic agents and sedatives may be necessary to achieve desired effects based on each individual’s metabolic reaction to certain medications. Acetaminophen should be used with caution in both the ALD patient and patients who consume alcohol when fasting. It is important to keep in mind that ALD patients who present with increased lab results related to liver function, ascites, encephalopathy, and/or malnutrition, drug metabolism will most likely be impaired (Little, Falace, Miller, and Rhodus, 2002).

Alcohol acts to decrease or increase the effect of prescribed and non-prescribed drugs. Individuals who are abusing alcohol and have issues with gastric bleeding and other hemostatic problems should avoid aspirin and non-steroidal anti-inflammatory drugs (NSAIDS).

Metronidazole, commonly used to treat periodontitis, can cause a profound reaction if used in combination with alcohol (similar to an alcohol/disulfiram reaction). The combination of opioids (e.g. hydrocodone, oxycodone) and alcohol enhances the sedative effect of both and increases the risk of overdose.

**Risk of spread of infection:** ALD patients may require use of prophylactic antibiotics if a chronic infection is present prior to treatment. While policy does not require use, ALD patients often present with diminished immune response. Coupled with ongoing infection, use of antibiotics should be taken into account on an individual patient basis.
**Cocaine and Methamphetamine:** A patient under the influence of cocaine, methamphetamine, or other stimulant, should not receive treatment if the patient reports using the drug in the previous 24 hours. Vasoconstrictor drug interactions involving tricyclic antidepressants, nonselective beta-adrenergic blocking drugs, certain general anesthetics, and cocaine are known to have the potential to cause serious morbidity or death. (Bolton 2003) Careful administration of small doses of vasoconstrictors and avoidance of gingival retraction cord containing epinephrine, coupled with the monitoring of a patient’s vital signs, should permit vasoconstrictors to be used with little or no risk. Only in the case of cocaine intoxication must adrenergic vasoconstrictors be avoided completely (Glick, 1997).

**Intraoral Findings**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Intraoral Manifestations</th>
</tr>
</thead>
</table>
| **Alcohol Abuse and Alcoholism** | • Oral cancer  
• Leukoplakia and other premalignant conditions  
• Oral mucosal changes  
• Inflammation of one or both parotid glands  
• Oral ulceration  
• Glossitis  
• Angular cheilitis  
• Candidiasis  
• Glossodynia  
• Prolonged bleeding  
• Facial tics  
• Oral and facial  
• High dental caries rate  
• Dental erosion  
• Bruxism  
• Increased calculus deposits  
• Halitosis (fruity acetone breath)  
• Delayed wound healing and unpredictable treatment response  
• Reduced tolerance to pain |
| **Stimulants** | • Xerostomia  
• Clenching, grinding bruxism |
| **Methamphetamine** | • Xerostomia  
• Clenching, grinding bruxism  
• Extensive and severe dental caries  
• Tooth loss |
| **Cocaine, crack cocaine** | • Xerostomia  
• Dental caries  
• Tooth loss  
• Localized attachment loss (cocaine testing-rubbing on gingival to test potency) |
**Table 12: Intraoral Findings**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Intraoral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heroin</strong></td>
<td>• Dental erosion associated with frequent vomiting</td>
</tr>
</tbody>
</table>
| **Long term opiate or opioid use** | • Xerostomia  
• Clenching, grinding bruxism                                                                                                                                                                                  |
| **Marijuana**             | • Stains often greenish gold in appearance, xerostomia, halitosis.  
• Increased caries due to increased appetite and consumption of highly cariogenic foods commonly referred to as the “munchies”.                                                                                     |
| **MDMA (Ecstasy)**        | • Clenching, grinding bruxism  
• Xerostomia                                                                                                                                                                                                          |
| **Tobacco**               | • Oral cancer and pre-cancerous lesions  
• Leading risk factor for tooth loss  
• Periodontitis  
• Delayed wound healing  
• Poorer prognosis following surgical and non-surgical treatment  
• Implant failure  
• Abrasion (spit tobacco use)  
• Increased supra and subgingival calculus deposits                                                                                                                                                                  |
| **Inhalants**             | • Sores around mouth or nose  
• Stains from paint, colored markers, etc., around mouth and nose                                                                                                                                                      |

*Methamphetamine:* Methamphetamine induced caries is a recent topic of concern among dental professionals. The cause, while under extensive investigation, is not understood. Factors that may attribute to the unique caries pattern include xerostomia, increased sugar intake, and increased ingestion of sodas flavored with citric acid. The use of methamphetamines may result in a chelation reaction that cleaves enamel from dentin, causes severe bruxism, leads to poor oral hygiene, or the patient avoiding dental treatment due to fear of being identified. To date, no studies have been conducted that considered baseline dental caries, decalcification, or dental plaque scores, therefore baseline dental status is unknown (Mandel, 2005).

![Figure 1: Common Caries found in a regular Patient.](image1)

![Figure 2: Caries found in a Meth abusing Patient.](image2)
Additional Considerations

Alcohol and tobacco are known risk factors for head and neck cancers, including oral cancer. A comprehensive extra and intraoral exam should be included in any patient’s treatment who is a known alcohol or tobacco user.

Non-alcohol containing rinses and topical agents should be used as a part of daily home care regimens for patients who are chemically dependent. For recovering alcoholics this is an important consideration in the discussion of home mouth rinses.

Anxiety and pain control methods should be carefully considered and discussed with any patient’s primary care physician or substance abuse therapist before administration, in cases of known substance abuse or chemical dependency. An open dialog between the recovering patient and the dental practitioner is useful when dealing with an anxious dental patient.

In situations where narcotics prescriptions are necessary for dental treatment or recovery, the number of doses should be limited. Acetaminophen should be limited during chronic and acute episodes of alcohol intake or for any patient over an extended time period. The risk of hepatotoxicity is always present in chronic alcohol users.

Members of the oral health team should be educated about chemical dependency and drug seeking behavior. In many cases, those who are chemically dependent may falsely claim to experience dental pain in an effort to get a prescription for a narcotic. You should be wary of a patient claiming an allergy to a weaker pain reliever, requesting specific drugs, or asking for more than a normal amount of drug to be prescribed. Additionally it is important to keep prescription forms away from areas where patients have access to them. Also, never pre-sign prescription forms. Drugs should be stocked in a locked cabinet away from treatment areas and only in quantities that are sufficient for immediate use. Disposal of unused drugs and spent carpules and needles should be handled according to OSHA guidelines for “sharps”. Drug users often search trash receptacles outside medical and dental offices looking for drugs or drug paraphernalia.

Patients who abuse alcohol and drugs often do not attend scheduled dental appointments and neglect to pay for services. This can cause emotional and financial strain on any dental practice.

Health care professionals have a responsibility to ensure the safety of their patients while in the office, and those who may be affected by their patient’s behavior. Legal responsibility in reporting drug or alcohol abuse is uncertain at best. Patient confidentiality laws prevent the health care provider from reporting substance abuse problems, which may become a larger issue if the abuse problem
causes an immediate threat to public safety (e.g., airline pilot, health professional). When in doubt, contact your state dental association and legal counsel regarding your obligations under state and federal laws.

**Impaired Oral Health Team Members**

Dentists and dental auxiliaries are not immune from alcoholism and other drug dependencies. In fact, in the dental community the danger of developing chemical dependency may be greater because of stress from the work environment, accessibility to drugs, and the desire of staff to protect their employers, employees, or co-workers.

Precipitating factors include:

- Genetics
- Family of origin issues
- Substance abuse prior to dental education
- High levels of stress: dental and dental hygiene education
- Dental practice
- Isolated practice setting
- Perceived limitations of reward in providing care to others
- Economic factors
- Access and availability of substances
- Unrealistic expectations of performance by self and others
- Belief in medication as a solution to
- Demand for quick results
- Focus on the needs of others

Abuse problems by dental personnel impairs professional competency, ability and judgment. An alcohol or drug problem left untreated may not only cause a dental professional to risk their professional career, but more importantly, endanger the life of a patient. Clues that you may be working with an impaired person are similar to those you may find in a drug seeking or chemically dependent patient. Avenues of communication need to be open so you can help your colleagues if they are in need.

A few issues to keep in mind include your responsibility for your DEA number and privileges. To prevent employees from obtaining unauthorized prescriptions for hydrocodone and other medications, dental professionals should write and/or call in all narcotic prescriptions and monitor personal prescription activity through the DEA.
Prevent Nitrous Oxide Abuse
In an effort to avoid abuse of nitrous oxide dental professionals should:
- Monitor purchase frequency and amount
- Be aware of dentist or staff members in the office after hours, and

Conclusion

Quality dental care, prevention of complications, and helping patients avoid relapse should be the primary goals in the treatment of chemically dependent individuals. It is estimated that 1:5 male patients in a dental practice abuse alcohol. Additionally approximately 1:16 female patients have a substance abuse problem. With alarming rates of increase in non-medical use of prescription drugs, the dental professional’s role in identifying and treating chemically dependent patients is important. Familiarity with the signs and symptoms of substance abuse and addiction are important clinical skills. Your role includes identification of substance abuse and dependency, education of the patient regarding risks related to substance abuse, and making necessary modifications in dental treatment to prevent harm or relapse.

Actions you can take include:
- Review your office health questionnaire and make sure it includes questions regarding current and previous drug and alcohol use
- Ask other dental professionals about ways in which they screen patients for substance abuse.
- Discuss potential drug and alcohol interactions with your patients.
- Offer your patients alternatives for pain and anxiety control
- Make printed information about substance abuse prevention available in your practice.
- If you educate oral health team members, include courses on chemical dependency in your curriculum.
- Find out what community substance abuse resources are available for information and treatment referral.
- Screen patients for signs of substance abuse and educate patients as to the potential risks of the use and abuse of alcohol, tobacco and drugs.
- Be aware of the connection between alcohol and/or drug abuse and infectious diseases (Hepatitis, tuberculosis, HIV).
- Examine your own health behavior, and do not engage in activity that is illegal or unhealthy
- Become involved in a peer-assistance program.

A commitment to understanding the nature of addiction, providing a supportive climate, and active participation in efforts to reduce the destructive effect of substance abuse is the obligation of every dental professional.
References


Appendix A: Glossary

**Abuse, substance** - The use of illegal drugs or the inappropriate use of legal drugs. The repeated use of drugs to produce pleasure, to alleviate stress, or to alter or avoid reality (or all three).

**Addiction** - is a complex brain disease. It is characterized by compulsive, at times uncontrollable, drug craving, seeking, and use that persist even in the face of extremely negative consequences. Drug seeking becomes compulsive, in large part as a result of the effects of prolonged drug use on brain functioning and on behavior. For many people, drug addiction becomes chronic, with relapses possible even after long periods of abstinence.

**Agonist** - Any chemical that binds to a receptor and elicits a pharmacologic response.

**Adrenergic vasoconstrictors** - This type of medicine has similar effects to adrenaline and makes blood vessels narrower. Because of the affect they have on the patient, they are commonly used by dentists to enhance the pain-relieving action of local anesthetics and to control local bleeding. Although normally considered safe for these applications, vasoconstrictors can participate in drug interactions that potentially are harmful to patients.

**Antagonist** - A chemical that competes for receptor binding sites with agonists.

**Antitussive** - Cough suppressing.

**Binge drinking** - defined as consuming more than five drinks or more on one occasion on one day within the past 30 days.

**Current Use (alcohol)** - At least one drink in the past month (includes binge and heavy use).

**Dependence** - the continued use and abuse of mood altering substances despite repeated adverse consequences to self and others. The illness is determined by genetic, physiological, biochemical and emotional vulnerability.

**Drink** - 12-ounce beer or wine cooler or 5 ounce glass of wine or 1.5 ounces of distilled liquor.

**Endogenous** - created within the body.

**Exogenous** - created outside the body.

**Illicit** - Illegal

**Methadone** - A synthetic narcotic used as a substitute for the narcotic analgesic drugs. Prevents withdrawal symptoms without providing euphoric effects and can almost completely block the effects of heroin (3).

**Moderate drinking** - defined as two drinks per day for males and one drink per day for females.

**Myelin** - Fatty tissue surrounding nerves.

**Neurons** – A neuron is an electrically excitable cell that processes and transmits information by electrochemical signaling, via connections with other cells called synapses. It is a fundamental component of the nervous system.

**Neurotransmission** – Neurotransmission is also called synaptic transmission, and it is an electrical movement within synapses caused by a propagation of nerve impulses. It is the message transfer from the axon of one nerve cell to the dendrite of another nerve cell.
Neurotransmitters - are a chemical messenger of neurologic information that is released from a nerve cell, which thereby transmits an impulse from a nerve cell to another nerve, muscle, organ, or other tissue. Next, neurotransmitters diffuse across the synaptic cleft to bind with specific receptors on the dendrite of the ‘message receiving’ neuron.

Psychoactive – A psychoactive drug, psycho-pharmaceutical or psychotropic is a chemical substance that acts primarily upon the central nervous system where it alters brain function, resulting in changes in perception, mood, consciousness and behavior.

Relapse - Recurrence of alcohol or drug-dependent behavior in an individual who has previously achieved and maintained abstinence for a significant time beyond the period of detoxification.

Tolerance - Physiological adaptation to the effects of the drugs, so as to diminish effects with constant dosages or to maintain the intensity and duration of the effects through increased dosage.

Treatment - Application of planned procedures to identify and change patterns of behavior that are maladaptive, destructive, or health injuring; or to restore appropriate levels of physical, psychological or social functioning.

Withdrawal - Cessation of drug or alcohol use by an individual in who dependence is established. Withdrawal Syndrome is the onset of a predictable constellation of signs and symptoms involving altered activity of the central nervous system after the abrupt discontinuation of, or rapid decrease in dosage of a drug

Appendix B: Common Slang Terms

Alcohol - Booze, sauce, juice, grog, piss

Amphetamine - Ups, Pep pills, Co-pilots, Bumblebees, Hearts, Footballs, uppers, bennies, black beauty, speed, crank, candy, white cross

Amyl and Isobutyl Nitrite - Poppers, rush, snappers

Barbiturate - Downers, Blue Devils, barbs, M&M, red devil, sleeper, yellow jacket, goof balls, peanuts

Benzodiazepine - Downer, lib tranq, V

Booty bumping - Insertion of methamphetamine into the rectum prior to anal intercourse

Cocaine - Blow, girl, lady, sniff, snort, snow, toot, flake, blast, dream, nose candy, cola

Codeine - School boy, Co-dine

Club Drugs - X, Adam, MDMA, G, Georgia Homeboy, Chalk, 8-ball, H-bomb, 007’s, 69’s, E.

Dextromethorphan - DMX, Skittling, Robo, Robo tripping, slang robe, K, boomers, Disneyland.

Fentanyl - By prescription: Actiq, Duragesic, and Sublimaze. Street names: Apache, China girl, China white, dance fever, friend, goodfellas, jackpot, murder 8, TNT, Tango and Cash, great bear.

Heroin and Cocaine - Speedball, bombita
Heroin - Mud, Brown sugar, Big H, Black tar, Harry, junk, crap, flea powder, H, smack, white horse, chiva,

Hydrocodone and muscle relaxer, Soma:  Hillbilly heroin

Inhalant - sniff, whiteout, snappers, air blast, bagging, huffing

LSD - Acid, tab, trip, purple haze, blaze

Marijuana laced with Opium - Thai Sticks

Marijuana - Reefer, Grass, Dope, Ganja, Mary Jane, pot, Colombian, herb, joint, stick, broccoli, weed, chronic, whackyweed, blunt, Buddha,

Mescaline - Peyote, chif, cactus

Methadone - Dollies, munk, jungle juice

Methamphetamine - Crystal meth, speed, crank

Methaqualone - Quaaludes, ludes, Valium

Morphine - M, cube, morf, mu

Narcotics - Hard stuff

Nitrous Oxide - Whippets, oz, laughing gas, buzz bombs, tanks

PCP - Angel dust, hog, wack, lovely, Peace pill, Zoom, Purple rain, gorilla pills

Rohypnol - Date Rape Drug, roofies, rphies, ruffies, R2, robe

Smokable Cocaine - Crack, freebase, eggs

Smokable Methamphetamine - Ice

Tobacco - Butt, chew, weed, cig, chaw, smoke

Appendix C: Online Resources

American Society of Addiction Medicine
"The nation's medical specialty society dedicated to educating physicians and improving the treatment of individuals suffering from alcoholism or other addictions."
http://www.asam.org/

Club Drugs
This NIDA site provides detailed descriptions and educational materials related to substances classified as “club drugs”.
http://www.clubdrugs.org

Controlling Exposures to Nitrous Oxide During Anesthetic Administration
http://www.cdc.gov/niosh/noxidalr.html
Drugs.com
This site provides a dictionary of prescription drugs along with a pill identifier program.
http://www.drugs.com/

Drug Enforcement Administration
http://www.usdoj.gov/dea/index.htm

Erowid.org
http://www.erowid.org/ is an online library containing extensive information relating to psychoactive drugs, plants, and chemicals; including entheogens, psychedelics, etc.

Food and Drug Administration
http://www.fda.gov/default.htm

Join Together Online
National resource center and meeting place for communities working to reduce substance abuse (illicit drugs, excessive alcohol & tobacco) and gun violence.
http://www.jointogether.org

RXLIST
This site lists the top 300 prescription drugs currently on the market and provides links to specific information about each one.
http://www.rxlist.com

National Clearinghouse for Alcohol and Drug Information (NCADI)
NCADI is the world's largest resource for current information and materials concerning substance abuse.
http://www.health.org/

The National Institute on Alcohol Abuse and Alcoholism
http://www.niaaa.nih.gov/

The National Center on Addiction and Substance Abuse at Columbia University
A unique think/action tank that brings together under one roof all of the professional disciplines (health policy, medicine and nursing, communications, economics, sociology and anthropology, law and law enforcement, business, religion and education) needed to study and combat all forms of substance abuse.
http://www.casacolumbia.org/

National Clearinghouse on Alcohol and Drug Information
NIDA Research Reports.
http://ncadi.samhsa.gov/

National Institute on Drug Abuse
http://www.nida.nih.gov

Nitrous Oxide Safety
http://www.cdc.gov/niosh/topics/nitrousoxide/

Street Drugs.org
http://www.streetdrugs.org/

Substance Abuse and Mental Health Data Archive
A searchable database for information related to substance abuse.
http://www.icpsr.umich.edu/SAMHDA/
The Substance Abuse and Mental Health Services Administration (SAMHSA)
http://www.samhsa.gov/

U.S. Department of Labor
The State Alcohol and Drug Abuse Agency Directory contains contact information for all State Alcohol and Drug Abuse Agencies, and provides a link to the Agency's Web site, if one exists. It is provided via the Center for Substance Abuse Treatment's (CSAT) Treatment Improvement Exchange (TIE) Web site.

The Web of Addictions
Dedicated to providing accurate information about alcohol and drug addiction.
http://www.well.com/user/woa/

Appendix D: Treatment and Informational Related Resources

American Dental Association
Linda Kittelson Keating, MS, RN, CSADC Manager, Dentist Health and Wellness Council on Dental Practice
American Dental Association
Phone: 312-440-2622 ext. 2622
Fax: 312-440-2924
Email: keatingl@ada.org
http://www.ada.org/

American Dental Hygienists’ Association
444 North Michigan Avenue, Suite 3400
Chicago, Illinois 60611
http://www.adha.org/

Adult Children of Alcoholics (ACA/Ace)
http://www.adultchildren.org/
P.O. Box 3216
Torrance, CA 90510
Phone: 562-595-7831
www.adultchildren.org

Al-Anon / Alateen
Family Group Headquarters, Inc.
1600 Corporate Landing Parkway
Virginia Beach, VA 23454-5617
Phone: (757) 563-1600
For meeting information in Canada, the US, and Puerto Rico call 1-888-4AL-ANON (1-888-425-2666) Monday through Friday, 8:00am to 6:00pm ET.
http://www.alcoholics-anonymous.org/

Alcoholics Anonymous (A.A.)
P.O. Box 459,
New York, NY 10163
Phone: (212) 870-3400
http://www.alcoholics-anonymous.org/

Center for Substance Abuse Treatment
National Drug and Alcohol Treatment Referral Service
(800) 662-HELP (4357) (English and Español)
(800) 487-4889 (TDD)
http://www.samhsa.gov/

Hazelden Educational Materials
PO Box 11
Center City, MN 55012-0011
Phone: 1-800-257-7810 or 651-213-4200
http://www.hazelden.org/

Monitoring the Future Survey
The Regents of the University of Michigan
Ann Arbor, MI 48109
provides the most current information on alcohol, drug use and other behaviors by high school students.

National Inhalant Prevention Coalition
322 - A Thompson Street
Chattanooga, TN 37405
Phone: 800.269.4237 or 423.265.4662
Email: nipc@io.com
http://www.inhalants.org/

National Alcohol and Substance Abuse Information Center
US Department of Health and Human Services
drug and alcohol abuse website and hotline.
Open 24 hours a day, seven days a week.
Phone: (800) 729-6686
TDD: (800) 487-4889
HTTP://WWW.ADDICTIONCAREOPTIONS.COM/

Narcotics Anonymous World Services, Inc.
Main Office
PO Box 9999
Van Nuys, California 91409 USA
Telephone (818) 773-9999
Fax (818) 700-0700
http://www.na.org/

Narconon International
4652 Hollywood Boulevard
Hollywood, CA 90027
Phone: 323-962-2404
Email: info@narconon.org
http://www.narconon.org/
Appendix E: American Psychiatric Assoc. Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)

Three or more of these criteria within the same 12-month period defines dependence:

1. Substance often taken in larger amounts or over a longer period of time than was intended
2. Persistent desire or unsuccessful efforts to cut down or control substance use.
3. A great deal of time spent in activities necessary to get the substance, use the substance, or recover from its effects.
4. Frequent intoxication or withdrawal symptoms when expected to fulfill major role obligations at work, school, or home.
5. Important social, occupational, or recreational given up or reduced because of substance abuse.
6. Continued substance use despite knowledge of having a persistent or recurrent psychological or physical problem that is likely caused or exacerbated by the use of the substance.
7. Tolerance, as defined by either:
   a. Marked tolerance (need for markedly increased amounts of the substance).
   b. Markedly diminished effect with continued use of the same amount of the substance.
8. Withdrawal, as manifested by either of the following:
   a. Characteristic withdrawal symptoms
   b. Substance often taken to relieve or avoid withdrawal symptoms.

Substance abuse is defined as (where the criteria for dependence have not been met) meeting one or more of the following criteria:

1. Continued use despite knowledge of having persistent or recurrent social problems caused by or exacerbated by the effects of the substance.
2. Recurrent substance use in situations in which use is physically hazardous.
4. Recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home.

Appendix F: Schedules of Controlled Substances

The Controlled Substances Act (CSA), Title II of the Comprehensive Drug Abuse Prevention and Control Act of 1970, provides the legal foundation for regulation and enforcement of laws pertaining to the manufacture and distribution of drugs. All drugs are placed in one of five schedules. Prescription authority of health care providers is based on this schedule.

According to the DEA, these lists are intended as general references and are not comprehensive listings of all controlled substances.

Schedule I
Drug or other substance has a high potential for abuse
Drug or other substance has no currently accepted medical use
Lack of accepted safety for use of the drug or substance under medical supervision (Examples: Marijuana, Heroin, and LSD)

Schedule II
- Drug or other substance has high potential for abuse
- Drug or other substance has a currently accepted medical use in treatment
- Abuse of the drug or substance may lead to psychological or physical dependence (Examples: Cocaine, Percocet®, Ritalin®, Demerol®, Morphine, Fentanyl®, Adderall, and Oxycontin)

Schedule III
- Drug or other substance has a potential for abuse less than the drugs or other substances in schedules II or I
- Drug or other substance has a currently accepted medical use in treatment
- Abuse of the drug or other substance may lead to moderate or low physical dependence or high psychological dependence (Examples: Opium (may be schedule IV depending on amount of opium), Vicodin®, Tylenol w/codeine, Vicoprofin, buprenorphine, and some amphetamines)

Schedule IV
- Drug or other substance has a low potential for abuse relative to drugs or substances in schedule III
- Drug or other substance has a currently accepted medical use
- Abuse of the drug or substance may lead to limited physical or psychological dependence compared to drugs or substances in schedule III (Examples: Darvocet®, Valium®, Xanax®, Ativan®, Talwin-NX®, Phenobarbital, and Halcion®)

Schedule V
- Drug or other substance has a low potential for abuse compared to the drugs or substances in schedule IV
- Drug or other substance has a currently accepted medical use
- Abuse of the drug or substance may lead to a limited physical or psychological dependence (Examples: Lomotil®, Phenergan®, Robitussin AC)
Test
*If you have downloaded the course off the Internet and wish to submit your test online you must return to our website (www.accesscontinuingeducation.com) to do so.

Please mark only one best answer to the following questions on the one page answer sheet.

This test contains 20 questions. Please mark your answers in spaces numbered 1 through 20 on your answer sheet.

1. According to this text, approximately how many male dental patients abuse alcohol?
   a. 1:5
   b. 1:20
   c. 1:50
   d. 1:100

2. Drug and or alcohol abuse can be defined as:
   a. The use of any drug that deviates from approved medical or social patterns
   b. Physical or psychological reliance on an exogenous substance
   c. Chronic, progressive and compulsive use of a substance
   d. All of the above

3. Considering a patient who has alcoholic liver disease (ALD) the dentist should:
   a. Expect prolonged bleeding times
   b. Expect delayed wound healing
   c. Consult the patient’s physician prior to invasive treatment
   d. All of the above

4. According to the 2009 National Household Survey on Drug Abuse the age group reporting the highest level of current drug use was:
   a. 12-14 year olds
   b. 18-25 year olds
   c. 20-35 year olds
   d. 40-55 year olds

5. Extraoral signs of inhalant abuse include:
   a. stained teeth
   b. sores or burns around mouth and/or nose
   c. paint stains around mouth and/or nose
   d. B and C

6. The brain’s reward system only responds to exogenous stimuli.
   a. True
   b. False
7. Intraoral signs of methamphetamine use include:
   a. Severe and extensive carious lesions
   b. Xerostomia
   c. Dental attrition
   d. All of the above

8. Drugs which depress nervous system activity, include:
   a. Alcohol, codeine, nicotine and methamphetamine
   b. Nitrous Oxide, alcohol and crack cocaine
   c. Adderall, PCP and LSD
   d. Benzodiazepines, barbiturates and alcohol

9. A narcotic abuser in withdrawal (within 24 hours to 10 days after their last drug use) is likely to exhibit which of the following signs and symptoms:
   a. Drug seeking behavior
   b. Runny nose, abdominal cramps, and weight loss
   c. Increased attention to detail
   d. A and B

10. The recent increase in inhalant use may be attributed to:
   a. Availability in the home
   b. Readily available information related to use such as Internet resources
   c. Obscure signs and symptoms
   d. All of the above

11. If you suspect your patient is under the influence of cocaine or methamphetamine, you should:
   a. Alert police
   b. Refuse to treat the patient
   c. Defer care for at least 24 hours after patient reports last use of drug
   d. None of the above

12. The most widely used stimulant is:
   a. Nicotine
   b. Amphetamines
   c. Cocaine
   d. Caffeine

13. Individuals abuse hallucinogens because:
   a. They often desire to repeat the experience
   b. They experience physical need for the drug
   c. They are readily available and inexpensive
   d. They cannot be detected in the system after 24 hours
14. The oral health team member’s greatest challenge is to motivate the patient in the stage of pre-contemplation into the next stage of change.
   a. True
   b. False

15. Intraoral signs/symptoms of marijuana use include(s):
   a. Goldish green staining of teeth
   b. Benign migratory glossitis (geographic tongue)
   c. Halitosis
   d. A and C

16. Screening for drug and alcohol problems:
   a. Is not appropriate in the dental office
   b. Is completed only at the request of the patient
   c. Should be conducted during routine dental visits
   d. None of the above

17. If chemically dependent/addicted patients are not ready to change their behavior you should:
   a. Call the police immediately and have the patient arrested.
   b. Restate your concern for their health and modify dental treatment accordingly.
   c. Dismiss the patient from your practice.
   d. Arrange for a psychiatrist to visit during the dental exam.

18. The use of local anesthetics is contraindicated when treating:
   a. Individuals under the influence of cocaine
   b. Recovering alcoholics
   c. Former marijuana users
   d. None of the above

19. You should modify dental treatment for patients recovering from chemical dependency by doing all of the following except:
   a. Consult with patient’s substance abuse counselor regarding pain control
   b. Use non-alcohol containing mouth rinse
   c. Criticize the patient about former drug abuse and addiction
   d. Discuss potential drug interactions or pain control methods

20. Primary goals for the dental practitioner when treating chemically dependent patients are:
   a. Diagnosis of chemical dependency and coordinating treatment
   b. Diagnosis of chemical dependency and distribution of clean needles
   c. Providing quality dental care, preventing complications, and helping patients avoid relapse
   d. A and C.