

Pharmacotherapy in Addiction Treatment

by Valerie Prince, PharmD, FAPhA, BCPS
The author has no disclosures or conflicts of interest to report.

COMPLETE ARTICLE AND CE EXAM
AVAILABLE ONLINE: WWW.PSWI.ORG



 CE FOR TECHNICIANS ONLY.

Scenario 1: Mrs. White is a pleasant 35 year-old woman who comes into your pharmacy with a prescription for a hydrocodone product. When you enter her prescription in the computer you notice that she had a 30-day supply of this medication filled 10 days ago. When you check her profile, you find that she has filled prescriptions for narcotics from four different physicians during the past month.

Scenario 2: Rob is a 42 year-old pharmacist at your store. During the past year, you notice that Rob is at the pharmacy more than any one else. He signs up for every extra shift, holidays, and even comes in on his off day. Rob has become moody and unpredictable behind the counter. He often takes long bathroom breaks and sometimes he can't seem to remember what he did or said during a previous shift. He speaks in an almost panicked tone about his upcoming vacation days that he is being forced to use.

Scenario 3: Susan is a 28 year-old technician who has worked with you for almost ten years. When you first met Susan, she was very involved in church and her community softball league. During the past two years Susan has become almost reclusive and she avoids contact with her friends at any time other than "tailgating" or other occasions where drinking to the point of intoxication is common. Susan is drastically underweight and she was recently admitted to the hospital for a "bleeding episode".

What could be the common denominator in all these scenarios?

INTRODUCTION

"Addiction" is a popular word in lay language that is used to describe both serious and silly issues. "I'm addicted to Grey's Anatomy." "I'm addicted to chocolate," etc. The medical term to describe a patient who is addicted

Objectives

At the conclusion of this activity, the pharmacy technician should be able to:

1. Describe common signs and symptoms associated with chemical dependency.
2. Differentiate among terms relating to addiction such as physical dependence, chemical dependence, and pseudoaddiction.
3. List three drugs used in the management of chemically dependent patients.

to drugs or alcohol is substance dependence or chemical dependence. According to the Substance Abuse and Mental Health Services Administration's (SAMHSA's) National Survey on Drug Use and Health in 2006, 9.6 percent of the persons aged 12 or older needed treatment for an illicit drug or alcohol abuse problem. Substance dependence is a disease that develops in individuals from all socioeconomic classes. According to SAMHSA, in 2006 there were nearly 1.8 million admissions for treatment of alcohol and drug abuse to facilities that report to state administrative data systems. About 59 percent of patients were white, 21 percent African-American, 14 percent Hispanic/Latino, 2.3 percent Alaska Native or American Indian and 1 percent Asian/Pacific Islander. Most admissions (40 percent) were for alcohol treatment. Opiates (including heroin) was the next most common drug of choice for patients admitted for treatment.

DEFINITION

The term alcoholic is used to describe patients with substance dependence whose drug of choice is alcohol. Addict is a term often used in lay language to describe a substance dependent patient whose drug of choice is narcotics, marijuana, stimulants, or other mood altering drugs. The medical term substance dependence encompasses both these lay terms because the basic pathophysiology of the disease is the same regardless of the substance abused by the patient.

The following definition was approved by the American Society of Addiction Medicine and the National Council on Alcoholism and Drug Dependence:

Alcoholism is a primary, chronic disease with genetic, psychosocial, and environmental factors influencing its development and manifestations. The disease is often progressive and fatal. It is characterized by continuous or periodic impaired control over drinking, preoccupation with the drug alcohol, use of alcohol despite adverse consequences, and distortions in thinking, most notably denial.

"Primary" refers to the nature of alcoholism as a disease entity in addition to and separate from other pathophysiologic states which may be associated with it. "Primary" suggests that alcoholism, as an addiction, is not a symptom of an underlying disease state.

"Disease" means an involuntary disability. It represents the sum of the abnormal phenomena displayed by a group of individuals. These phenomena are associated with a specified common set of characteristics by which these individuals differ from the norm, and which places them at a disadvantage.

"Often progressive and fatal" means that the disease persists over time and that physical, emotional, and social changes are often cumulative and may progress as drinking continues. Alcoholism causes premature death through overdose, organic complications involving the brain, liver, heart and many other organs, and by contributing to suicide,

homicide, motor vehicle crashes, and other traumatic events.

“Impaired control” means the inability to limit alcohol use or to consistently limit on any drinking occasion the duration of the episode, the quantity consumed, and/or the behavioral consequences of drinking.

“Preoccupation” in association with alcohol use indicates excessive, focused attention given to the drug alcohol, its effects, and/or its use. The relative value thus assigned to alcohol by the individual often leads to a diversion of energies away from important life concerns.

“Adverse consequences” are alcohol-related problems or impairments in such areas as: physical health (e.g., alcohol withdrawal syndromes, liver disease, gastritis, anemia, neurological disorders); psychological functioning (e.g., impairments in cognition, changes in mood and behavior); interpersonal functioning (e.g., marital problems and child abuse, impaired social relationships); occupational functioning (e.g., scholastic or job problems); and legal, financial, or spiritual problems.

“Denial” is used here not only in the psychoanalytic sense of a single psychological defense mechanism disavowing the significance of events, but more broadly to include a range of psychological maneuvers designed to reduce awareness of the fact that alcohol use is the cause of an individual’s problems rather than a solution to those problems. Denial becomes an integral part of the disease and a major obstacle to recovery.

OTHER TERMS

Physical dependency refers to the phenomenon of the body adapting to the presence of a drug and undergoing withdrawal if the drug is stopped abruptly or the dose is dramatically decreased. Patients can become physically dependent on many types of prescription drugs such as beta blockers, steroids, and narcotics when used to treat legitimate pain. Physical dependency alone is not the same as substance dependence. Many patients who must take narcotics for legitimate pain become physically dependent, but they do not experience the loss of control and compulsive and continued use despite adverse consequences that characterizes substance dependence.

Tolerance refers to a patient’s need for increasing doses of a drug to get the same effect. Tolerance alone is not the same as substance

dependence. Patients who take narcotics for chronic pain must often increase the dose over time due to the development of tolerance. Again, this increase in dose alone is not indicative of “addiction” unless it is accompanied by compulsive, consequential use.

Pseudoaddict is a term often used to describe a behavior that at first glance might seem to be compulsively drug seeking. This is often seen in chronic pain patients who are receiving inadequate pharmacotherapy to address their pain. The patient may resort to “doctor-shopping” or attempting early refills in an effort to gain pain relief. A key difference between this behavior and that of a substance dependent patient is the ability for the patient to stop seeking drugs once pain relief has occurred. A substance dependent patient will continue to compulsively seek out ways to use escalating amounts of mood altering substances, while a pseudoaddict is greatly relieved to abandon the search for more pain control agents.

PATHOPHYSIOLOGY

Addiction is a brain disease with behavioral manifestations. The human brain in some patients changes in structure and function with chronic exposure to mood altering substances. Initial exposure to mood altering substances is usually voluntary. With repeated exposure,

Areas of the brain that are impacted by drugs of abuse (including alcohol) are the brain stem, the limbic system, and the cerebral cortex.

a minority of patients experience complex changes in brain physiology and anatomy. Brain imaging studies in substance dependent patients show physical changes in areas of the brain critical to judgment, decision making, learning and memory, and behavior control. These changes are thought to explain the compulsive and destructive behaviors of addiction.

Areas of the brain that are impacted by drugs of abuse (including alcohol) are the brain stem, the limbic system, and the cerebral cortex. The brain stem, also known as the primitive brain, controls “instinctive” functions such as heart rate, breathing, and sleeping. The limbic system

is the seat of the brain’s reward circuit. It links together many brain structures that control our ability to feel pleasure and it is responsible for our perception of emotion. Stimulating the reward system in the brain motivates us to repeat behaviors, such as eating or engaging in reproductive activities, which are critical to our existence. Drugs of abuse stimulate this reward circuit in a much more powerful way than any natural stimulus. The cerebral cortex controls our ability to think, plan, solve problems, and make decisions. Signals from the brain stem and limbic system feed into the cerebral cortex. Drugs of abuse interfere with the communication mechanisms in the brain as well as flooding the reward circuit with highly stimulating amounts of dopamine. The result on the brain’s reward circuit in addicts is that normal behaviors that would have previously resulted in stimulation of the circuit, such as kissing a favorite person, hitting a home run, or eating a favorite food, will no longer stimulate the circuit. The abuser eventually feels flat, depressed, and unable to feel pleasure from anything, including the drug of choice. The brain is wired to seek out stimulation of the circuit, and the user continues to take the drugs seeking the stimulation, but they eventually cease to provide the rewarding effects they did initially. At first the drug of choice produces euphoria, then the patient progresses to a state where he/she doesn’t feel “normal” without the drug, and then eventually into a state where the drug use itself is no longer pleasurable, but feels necessary for survival to the addict, who continues to use compulsively to avoid withdrawal.

ETIOLOGY

Addiction is a biopsychosocial disease. Biological, psychological, and social factors influence the development and manifestation of addiction.

Genetic factors are estimated to account for between 40–60 percent of a patient’s vulnerability to addiction. Children of alcoholics are three to four times more likely to develop alcoholism than the general population. Adoption studies have shown us a four times greater risk of developing alcoholism still exists among children who were raised by adoptive non-alcoholic parents if the biologic parents were alcoholic. When the adopted children were raised by alcoholic adoptive parents but had non-alcoholic biological parents, the children were found to have no increased risk compared to the general

population or control groups.

No single genetic factor is thought to be responsible for the predisposition to addiction. Human research has shown multiple biological markers that are different in alcoholics and children of alcoholics from the non-alcoholics and patients who are family history negative for alcoholism. Some examples of these markers are alterations in brain wave activity, decreased levels of monoamine oxidase, an enzyme responsible for the degradation of neurotransmitters, and decreased levels of adenylate cyclase (AC), which is important for communication among neurons in the brain. A landmark study in young adult males found that the majority of male children of alcoholics exhibit low sensitivity to alcohol compared to males from non-alcoholic families. "Low sensitivity" was measured by subjective parameters such as perceived degree of intoxication and objective parameters such as body sway and cortisol release. At the eight year follow up point of this study, 60 percent of the children of alcoholics who demonstrated low

sensitivity to alcohol were alcoholic themselves.

Environmental factors also play an important role in the etiology of addiction. In children, home and family factors are important. In adolescents, peer and school environments can be influential. For adults, acute or chronic stress is significant risk factor. Environmental stress causes cortisol release resulting in an alteration in physiology that enhances response from psychoactive drugs.

DIAGNOSIS

Substance dependence can be very difficult to diagnose by untrained people, even physicians who do not have special training in the field of addiction medicine. It is important for pharmacists and pharmacy technicians to have exposure to the diagnostic criteria only because it allows us to recognize the characteristic manifestations of the disease. See Table 1.

CLINICAL PRESENTATION

Compulsion, loss of control, craving, and continued use despite adverse consequences

are "the four C's" of addiction, and they can almost always be seen in an addict. Denial is the primary symptom of addiction. Many addicts have abstinent periods in an attempt to control drug use. Nearly all addicts initially believed they could stop using drugs on their own, and many try to do so without treatment. However, most of these attempts result in failure to sustain remission. The addict's disease progresses and he/she becomes progressively isolated from everyone. The patient may become very overly sensitive or experience rapid mood swings. Significant physical symptoms usually do not appear until late stages of the disease. This is the stage some health care providers who specialize in addiction call the "TDL" (too darn late) stage. Unfortunately, this is the stage most pharmacy personnel who are addicts are in before they are identified and sent for treatment.

CLINICAL COURSE

Addiction often begins with social drug use. Some addicts first used prescription drugs for legitimate medical purposes. Use progresses to abuse in many individuals. A small fraction of abusers will progress to addiction. The vast majority of alcohol abusers will never become dependent. Abusers chronically expose their brains to their drug(s) of choice. This can result in the unmasking of a genetic predisposition which results in changes in brain structure and function leading to compulsive and consequential drug use. Addiction is a progressive illness even during periods of abstinence. An addict who returns to drug use after a period of abstinence may exhibit a significant increase in drug use and undesirable behaviors. Relapses (exacerbations) are common for most chronic disease states including addiction. Relapse rates are as follows for asthma (50–70 percent), HTN (50–70 percent), Type 1 diabetes (30–50 percent) and addiction (40–60 percent). Many environmental, social, or psychological factors can make relapse more likely. A few examples of this are stress from work or family problems, or encountering places, things or even smells associated with drug use.

LONG TERM COMPLICATIONS

Mortality rates for alcoholics are increased two to three fold over non-alcoholics at any age. This author has witnessed multiple patient deaths resulting from long term physical complications of addiction. Examples include the alcoholic patient who finally died in the ICU after weeks of bloody tears and urine from a platelet count that was too low to sustain life, the 60-pound

TABLE 1: DIAGNOSTIC AND STATISTICAL MANUAL 4TH EDITION TEXT REVISION (DSM-IV-TR) CRITERIA FOR SUBSTANCE DEPENDENCE

A maladaptive pattern of substance use, leading to clinically significant impairment or distress, as manifested by three or more of the following occurring at any time in the same 12-month period:

1. Tolerance

- a. a need for markedly increased amounts of the substance to achieve intoxication or desired effect
- or
- b. markedly diminished effect with continued use of the same amount of the substance

2. Withdrawal

- a. the characteristic withdrawal syndrome for the substance
- or
- b. the same, or closely related substance, is taken to relieve or avoid withdrawal symptoms

3. The substance is taken in larger amounts or over a longer period than was intended

4. There is a persistent desire or unsuccessful efforts to cut down or control substance use

5. A great deal of time is spent in activities to obtain the substance (e.g. visiting multiple doctors or driving long distances), use the substance (e.g. chain smoking), or recover from its effects

6. Important social, occupational, or recreational activities given up or reduced because of substance use

7. The substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance

alcoholic female who died of a gastrointestinal bleed, the 34 year-old mother of three who died from cirrhosis, and others too numerous to mention. Most psychoactive drugs have multiple toxicities, and most addicts, regardless of their drug of choice, have multiple organ toxicities as a result of long term use. Addiction is a fatal disease.

INTERVENTION

Research has proven that treatment does not have to be voluntary to be effective. Data collected from patients who began treatment under “coerced” conditions (such as the order of a judge or children’s services department) shows that involuntary treatment is as effective as treatment that results from self-reports by addicts. Most states have some form of a pharmacist’s recovery network (PRN) or other assistance program in place to help pharmacists who are chemically dependent. Many of these programs can assist student pharmacists and pharmacy technicians as well. To contact the PRN or other assistance organization in an individual state, contact the state pharmacy association, state board of pharmacy, or search www.usaprn.org.

TREATMENT PRINCIPLES

Goals of therapy for the addict are as follows: long periods of abstinence with minimal relapse, minimize long term complications, minimize threat of harm to others by the patient, and increase in the overall health of the patient (emotional, physical, social, etc). It is not realistic to expect most patients with chronic disease states such as diabetes, asthma, hypertension, or addiction to be perfectly compliant with therapy and remain in remission for the rest of his/her life after a single course of therapy. Treatment teaches the addict management of his/her disease state, but it does not completely reverse the pathophysiological changes in the brain caused by addiction. No single treatment modality is appropriate for all individuals. There are a variety of treatment options available and the treatment plan must be individualized for the patient. Extensive data documents that drug addiction treatment is as effective as treatments for most other similarly chronic medical conditions.

Medical detoxification is the first stage of addiction treatment. Detoxification does not have impact on long term drug use and must be followed up by other treatment modalities to adequately address the disease. There are many forms of effective drug addiction treatment.

The National Institute of Drug Abuse has published consensus recommendations based on the best available scientific evidence regarding drug addiction treatment. According to Principles of Drug Addiction Treatment, counseling and other behavioral therapies are critical components of effective treatment for addiction. Medications may also be important therapeutic tools but they should always be used in conjunction with, not instead of, behavioral therapy. Behavioral therapies teach patients strategies for coping with drug cravings, how to replace drug-using activities with constructive and rewarding nondrug-using activities, and it teaches them ways to prevent relapse and deal with relapse if it occurs. Behavioral therapy also helps the patient

with personal relationships and increases the individual’s ability to function in the family and community. Effective treatment attends to multiple needs of the individual, such as medical, psychological, social, and vocational needs in addition to drug use issues. According to the Principles for Drug Abuse Treatment, it is critical for the patient to remain in treatment for an adequate period of time for maximal effectiveness. This is one way medications can be important for treatment because many studies have shown adjunctive medications can assist in keeping patients compliant with behavioral or other therapies.

Self-help programs can also be an important adjunct to professional treatment and can extend the effects of a formal treatment course. Examples of well-established self-help programs are Alcoholics Anonymous (AA), Narcotics Anonymous (NA) and Cocaine Anonymous (CA), all of which are based on the 12-step model. Twelve step groups are sources of support and they do not claim to be treatment modalities. There are no dues or fees associated with AA and the only requirement for membership is a desire to stop drinking. Twelve-step meetings are often a mandatory component of a patient’s “aftercare.” Aftercare is the term used to describe the continuing treatment plan that extends months to years following the patient’s last formal professional treatment. For impaired health care professionals, specialized 12-step groups exist such as International Pharmacists Anonymous (IPA).

According to conservative estimates, every dollar invested in addiction treatment programs yields a return of between four to seven dollars in reduced drug-related crime, criminal justice costs and theft alone. When savings related to health care are included, total savings can exceed costs by a ratio of 12 to one. Major savings to the individual and society also come from significant drops in interpersonal conflicts, improvements in workplace productivity, and reductions in drug related accidents.

PHARMACOTHERAPY IN ADDICTION TREATMENT

Methadone has been used for many years to help individuals addicted to heroin and other opioids to stabilize their lives and reduce illicit drug use. Methadone stimulates the same receptor heroin does enough to prevent withdrawal but not enough to produce euphoria in heroin addicts. It will also block the opioid receptor enough to prevent a euphoric

Additional Reading

- National Institutes of Health Pub No. 07-5605. *Drugs, Brains, and Behavior: The Science of Addiction*. February 2008.
- National Institute of Drug Abuse Info Facts. *Treatment Statistics*. June 2008.
- Substance Abuse and Mental Health Services Administration, Office of Applied Studies, *Treatment Episode Data Set (TEDS) Highlights 2006*. National Admissions to Substance Abuse Treatment Services, DASIS Series, S-40, DHHS Publication no. (SMA) 08-4313, Rockville, MD.
- National Institute of Drug Abuse Info Facts. *Treatment Approaches for Drug Addiction*. June 2008.
- National Institute of Drug Abuse Info Facts. *Prescription and Over the Counter Medication*. July 2008.
- Graham AW, Schultz TK, Mayo-Smith MF, Ries RK, Wilford BB, editors. *Principles of Addiction Medicine*. Third ed. Chevy Chase, Maryland. American Society of Addiction Medicine Inc; 2003.
- *Principles of Drug Addiction Treatment*. National Institute on Drug Abuse. National Institutes of Health. NIH publication no. 99-4180. 1999.
- West, SL, Garbutt JC, Carey TS, et al. *Pharmacotherapy for alcohol dependence*. Evidence report number 3. (Contract 290-97-0011 to research Triangle Institute, University of North Carolina, Chapel Hill). AHCPR publication no. 99-E004. Rockville, MD; Agency for Health Care Policy and Research; January 1999.

effect in those who take heroin or other opioids while on methadone maintenance therapy. Methadone may produce euphoric effects in patients who are not already heroin addicts and who use psychoactive drugs recreationally, so the distribution of methadone must be closely monitored. According to a large body of research, patients undergoing methadone maintenance treatment do not experience the medical abnormalities and behavioral destabilization that rapid fluctuation in the drug levels cause in heroin addicts. Therapy may be continued during pregnancy. An infant born to a mother on methadone maintenance therapy experiences minimal withdrawal symptoms compared to a patient actively using heroin. The duration of therapy for methadone maintenance varies widely among individual patients and practitioners. Methadone can also be used as a legitimate chronic pain medication. Dosing for methadone in methadone maintenance therapy is once daily, because it only takes one administration a day to block the opioid receptor. Dosing with methadone for pain management requires multiple doses a day for the pain control mechanism to work correctly. Any licensed physician can write prescriptions for methadone for pain management, but only certain physicians can

write methadone prescriptions for methadone maintenance therapy.

Buprenorphine is also an opioid agonist. It has been proven effective in suppressing opioid withdrawal symptoms, reducing craving, blocking the euphoric effect of opioids, and helping patients remain in treatment for addiction longer. Buprenorphine orders can be written by physicians who have completed special training. Naloxone is a narcotic antagonist added to some forms of buprenorphine that will precipitate withdrawal if an opioid abuser crushes the tablet and snorts or injects the drug. Naloxone was added to buprenorphine to help prevent diversion of buprenorphine by recreational opioid abusers.

Disulfiram has been used for many years as a form of aversion therapy in alcoholics. Disulfiram has variable efficacy and is not a first line treatment for alcoholics. It works by causing unpleasant reactions such as severe flushing, headaches, nausea and palpitations in response to ingestion of alcohol. In a minority of disulfiram patients, alcohol ingestion results in life-threatening symptoms such as cardiac arrest, severe hypotension, or convulsions. The disulfiram reaction may occur with ethanol ingestion up to two weeks after discontinuing the drug.

Acamprosate is an effective treatment for alcoholism. Studies have shown that patients on acamprosate experience decreased craving, decreased number of relapses, and increased completion of prescribed treatment. It is not aversion therapy like disulfiram and it does not target the opioid receptor specifically. The exact mechanism of action of acamprosate is unknown but it may be alteration of gamma-aminobutyric acid (GABA) and glutamate transmission. Acamprosate appears to decrease the long lasting neuronal hyperexcitability that follows chronic alcohol use.

Naltrexone is an opiate antagonist. This drug is approved for use in both opiate and alcohol dependence. Naltrexone has been shown to be effective in reducing relapse and decreasing craving. It blunts euphoria associated with alcohol ingestion and the patient experiences sedation instead. The beneficial effects of naltrexone diminish gradually over time. Naltrexone therapy has been shown to be helpful in keeping patients in a treatment program for the full time period needed. ●

The content of this lesson was originally developed by the Alabama Pharmacy Association, UPN: 178-000-09-205-H04-T. Participants should not seek credit for duplicate content.

COMPLETE ARTICLE AND CE EXAM
AVAILABLE ONLINE: WWW.PSWI.ORG



ASSESSMENT QUESTIONS

Addiction

- According to the Substance Abuse and Mental Health Services Administration's (SAMHSA's) National Survey on Drug Use and Health in 2006, ____ percent of the persons aged 12 or older needed treatment for an illicit drug or alcohol abuse problem?
 - 25%
 - 10%
 - 5%
 - 1%
- Which of the following IS a component of the American Society of Addiction Medicine definition of alcoholism?
 - High volume alcohol consumption
 - Daily alcohol consumption
 - Use of alcohol despite adverse consequences
 - Use of alcohol when alone
- Which of the following statements is TRUE concerning the role of genetics in the etiology of alcoholism?
 - Children of alcoholics are born with a predestination to be alcoholics.
 - Children whose biological parents were alcoholics have a four fold risk of developing alcoholism when compared to the general population.
 - Children whose adoptive parents are alcoholic have a four fold risk of developing alcoholism when compared to the general population.
 - Scientists have identified a single alcoholism gene that can be detected with genetic testing.
- Which of the following neurotransmitters is released in the reward circuit of the brain producing feelings of pleasure?
 - Dopamine
 - GABA
 - Acetylcholine
 - Norepinephrine
- Which of the following IS a component of the DSM-IV diagnostic criteria for substance dependence?
 - Daily drinking for a period exceeding 3 months
 - Drinking in response to stressful situations
 - Drinking greater than three 2 oz drinks within a 6 hour period frequently
 - Drinking larger amounts than intended
- _____ is the primary symptom of addiction.
 - Irresponsibility
 - Denial
 - Dishonesty
 - Thrill seeking
- Which of the following principles of addiction treatment are TRUE?
 - Medical detoxification by itself does little to change long term drug use
 - Medications should never be used in the treatment of addiction
 - Treatment has to be voluntary to be effective
 - Long term inpatient treatment is preferred for all patients

8. Which of the following is an opioid agonist used in the management of opioid addicts?
 A. Disulfiram
 B. Methadone
 C. Naltrexone
 D. Acamprostate
9. Which of the following is FDA approved for the treatment of alcohol and opioid dependence?
 A. Disulfiram
 B. Methadone
 C. Naltrexone
 D. Acamprostate
10. Which of the following is the estimated ratio of total health care savings to addiction treatment costs?
 A. 12:1
 B. 5:1
 C. 10:1
 D. 20:1
11. This activity met my educational needs
 A. Met all educational needs related to the topic

- B. Met some educational needs, but not all
 C. Did not meet my needs

Did the activity meet the stated learning objectives?

12. Describe common signs and symptoms associated with chemical dependency.

- A. Yes
 B. No

13. Differentiate among terms relating to addiction such as physical dependence, chemical dependence, and pseudoaddiction.

- A. Yes
 B. No

14. List three drugs used in the management of chemically dependent patients.

- A. Yes
 B. No

15. How would you rate the ability of the author to provide a high-quality educational activity?

- A. Very capable, article was well written and provided good information

- B. Somewhat capable, most information was presented well
 C. Needs improvement

16. How useful was this educational activity?

- A. Very useful
 B. Somewhat useful
 C. Not useful

17. How effective were the learning methods used for this activity?

- A. Very effective
 B. Somewhat effective
 C. Not effective

18. Learning assessment questions were appropriate.

- A. Yes
 B. No

19. Was the author free of bias?

- A. Yes
 B. No

QUIZ ANSWER FORM circle one answer per question



Submit CE Online
www.pswi.org



CE FOR TECHNICIANS ONLY.

CONTINUING EDUCATION CREDIT INFORMATION

The Pharmacy Society of Wisconsin is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education. Continuing education credit can be earned by completing the self assessment questions. Questions may be completed online at www.pswi.org or by mailing completed answer form to **PSW, 701 Heartland Trail, Madison, WI 53717.**

Participants receiving a score of 70% or better will receive by mail a statement acknowledging 1 hour (0.1 CEU) of continuing education credit within four to six weeks.

This CE offering is offered free-of-charge to all PSW members. Nonmembers are charged \$10 for each exam submitted to cover administrative costs.

- 1) a b c d
 2) a b c d
 3) a b c d
 4) a b c d
 5) a b c d
 6) a b c d
 7) a b c d
 8) a b c d
 9) a b c d
 10) a b c d

- 11) a b c
 12) a b
 13) a b
 14) a b
 15) a b c
 16) a b c
 17) a b c
 18) a b
 19) a b

Name _____ Designation (CPhT, etc.) _____

Preferred Mailing Address _____

City _____ State _____ Zip _____

Is this your home or work address?

May/June 2010
 Addiction

ACPE Universal Activity Number: 0175-9999-10-031-H04-T Target Audience: Pharmacy Technicians

Activity Type: knowledge-based

Release Date: May 1, 2010 (No longer valid for CE credit after May 1, 2013)