Chapter 6
CNS Stimulants: Use & Abuse

I love coffee, I love tea
I love the java jive and it loves me
Coffee and tea and the jivin' and me
A cup, a cup, a cup, a cup, a cup!
"Java Jive," 1940

The class of drugs designated as central nervous system (CNS) stimulants includes the two most frequently-used drugs on the planet, caffeine and nicotine. This class also includes the amphetamines, cocaine, and methylphenidate/Ritalin.

General Effects of Stimulants

All stimulant drugs cause an increase in general behavioral activity. When taken short-term (one or two weeks), stimulant drugs cause states of euphoria, optimism, and general feelings of well-being. Initial feelings of anorexia are frequent with stimulants, a quality that leads to their use/abuse in diet formulations. Insomnia is another common effect. These responses indicate that the part of the brain which controls these functions, the hypothalamus, is strongly affected. Other effects are:

- anxiety
- irritability
- decreased fatigue
- increased talkativeness
- increased blood pressure
- decreased feelings of depression
- increased thoughts and associations

Tolerance to stimulants

Tolerance to the mood-elevating and appetite-suppressing effects develops after about two weeks of daily use. Little tolerance develops to the behavioral-arousal effect, which is what makes these drugs useful in the long-term treatment of narcolepsy.[1]

Abuse of Stimulants & Treatments for Withdrawal

A person who is addicted to stimulants, or who has had a long period of continuous use, will experience withdrawal symptoms if the use is stopped abruptly. Symptoms of withdrawal from amphetamines and cocaine are very similar, mainly feelings of depression, fatigue, apathy, and general sluggishness—the opposite of effects seen under the influence of these drugs. These symptoms, though not physically dangerous, can be extremely uncomfortable.[2]

If a depressed person has been using stimulants on a long-term basis, has become physically dependent, or is abusing these drugs and increasing the dosage, then a severe depression may occur when the drug is withdrawn.[2] If the depression caused by withdrawal does not abate after a week or two, evaluation by a psychiatrist for antidepressant medication is appropriate.

AMPHETAMINES

Amphetamine, dextroamphetamine, and methamphetamine (collectively referred to as "amphetamines") all have very similar properties. The first amphetamine was synthesized in 1887, but it was not until the 1920's that it was investigated as a treatment for a variety of ills such as depression and decongestion. In the 1930's, an inhaler under the name Benzedrine was sold over-the-counter and marketed for the treatment of asthma, hay fever, and the common cold. Methamphetamine, discovered in 1919, is a crystalline powder that is easy to make (this is the "speed," "crank," or "meth" often made in illegal drug labs) and can be injected when dissolved in water. During World War II, amphetamines were sometimes used to push soldiers

to their limits, and even today "go pills" are used by military pilots. Dextroamphetamine/Dexedrine and methamphetamine/Methedrine were widely available in pill form in the 1950's; they were used by truck drivers and college students to stay awake, by athletes to enhance performance,[3] and by millions more as an appetite suppressant.

Ondansetron for amphetamine withdrawal

The antinausea drug ondansetron/Zofran has been found to stop cravings in early-onset alcoholics, and is now being tested as an aid for abstinence for people addicted to methamphetamine. People are unable to get high while taking it. It appears to work by enhancing 5-HT transmission.[4]

Cocaine

Evidence suggests that the coca plant, *Erythroxylum coca,* was domesticated in South America around 1500 BCE. To this day, coca is an important part of many cultures in the Andes, where it is used in social rituals and its leaves are chewed to provide stimulation and relief from hunger. The plant's active ingredient, cocaine, was isolated by chemists in 1860. In the latter half of the 19th century, cocaine was considered to be an elixir, and was added to many patent medicines. Coca Cola, which takes its name from the coca plant, included cocaine as an ingredient in 1885, and the drug's reputation helped make Coke the world's most popular soft drink. The cocaine was removed from Coca Cola in 1903 as its dangers began to be recognized.[5]

Cocaine (street names "coke," "crack," and others) is a potent CNS stimulant which is biochemically similar to the amphetamines and produces similar (although shorter-lasting) mood-elevating effects. The behavioral effects of cocaine are also similar to those of amphetamines. Cocaine in various forms (Novocaine, Lidocaine, Carbocaine) has been used as a local anesthetic agent for many years. A medicinal concoction of cocaine, methadone, and alcohol,

called "Brompton's cocktail," is sometimes given to terminally-ill patients in extreme pain. Brompton's cocktail is not used more generally because it has the potential to be highly addictive due to the rapid onset of both stimulant and euphoric effects.

Treatment for cocaine withdrawal

Recreational use of cocaine can be lethal, particularly if taken by injection. Fatality can result from heart failure, respiratory depression, stroke, or seizures.[2] In terms of psychological effects, cocaine use can produce a psychosis that is indistinguishable from one seen with paranoid schizophrenia. Physical dependence has not been demonstrated, although there is evidence that a very strong psychological dependence can develop.[2]

Many treatments for cocaine withdrawal are based on the belief that the reason many people use stimulant drugs is to self-medicate a depressive disorder. It is thought that people suffering from depressive disorders may not have enough endogenous NE and 5-HT, and they use stimulants to increase the amounts of neuromodulator available. In support of this theory are the positive results seen when the antidepressant desipramine/Norpramin (a TCA) is taken at the time of stimulant withdrawal. Desipramine works by inhibiting reuptake of NE, which results in an increase in NE at the synapse. This leads to an increase in neuronal stimulation, and increased feelings of energy. Patients taking an antidepressant medication may be less likely to use cocaine to ward off depression.

Psychotic symptoms in cocaine withdrawal

A treatment dilemma may occur if the cocaine user is also having psychotic symptoms and needs to be treated with an antipsychotic drug. Administration of antipsychotic drugs leads to an increased craving for cocaine, which may in turn lead to the patient increasing his or her drug use, which in turn leads to a worsening of psychotic symptoms.[2]

Dopamine agonists for cocaine withdrawal

The dopamine agonists bromocriptine/Parlodel and amantadine/Symmetrel both augment dopaminergic transmission in the CNS, and cause a decrease in the craving for cocaine. Either of these agents can be helpful if taken during the first month of cocaine withdrawal when the patient's cravings are strongest.

Problems with MAOI treatment for cocaine withdrawal

There are also serious problems related to the use of MAOIs for the depression frequently experienced during cocaine withdrawal. The combination of MAOIs and cocaine can lead to a fatal hypertensive crisis.

Amino acids for cocaine withdrawal

Another effective regimen which is much less risky if the patient starts to use cocaine again is treating withdrawal symptoms with the amino acid tryptophan. Since tryptophan is a 5-HT precursor, taking extra amounts of it will help to restore the 5-HT that has been depleted by cocaine use and will decrease the craving for cocaine. There is some evidence that tryptophan, by increasing the amount of 5-HT, can also help to alleviate the depression that may arise during cocaine withdrawal.

Two other amino acids, phenylalanine and tyrosine, have also been used to alleviate symptoms of depression during cocaine withdrawal. Both are precursors to neuromodulators and can help to restore a more normal balance of the substances that have been depleted due to cocaine use.

Cocaine vaccine

A vaccine is being tested that induces the formation of anticocaine antibodies. The antibodies and cocaine form a large molecular complex that has difficulty crossing the blood-brain barrier, which in turn leads to a decrease in the amount of cocaine that can get into

the brain. If only a small amount of cocaine can get into the brain, the impact of cocaine on the pleasure centers is greatly decreased. Addiction was extinguished using these methods in animal models. The antibodies remain in the blood and are effective for six months to one year, after which booster shots might be required. One danger with this treatment is that very large doses of cocaine might be able to overcome the antibodies, which could lead to a lethal overdose. It is expected that the vaccine will be a valuable adjunct when used with psychotherapy for cocaine users who want to overcome their addiction.[6]

Relapse prevention therapy (RP)/Harm reduction model

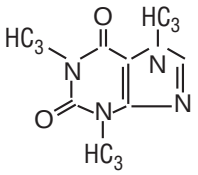
Relapse Prevention therapy (RP), also known as the Harm Reduction model, is one of the few scientifically validated psychosocial treatments for substance abuse and has been proven useful for treatment of cocaine abuse. No other type of treatment is without major difficulties. RP techniques help people recognize high-risk situations, rehearse ways to deal with them, self-monitor substance use, and learn to deal with cravings by understanding and discussing them. With this type of therapy, "lapses" in behavior are regarded as learning tools (i.e., ways to understand what happened) as well as opportunities to renew the commitment to sobriety. RP does not result in greater abstinence rates than other treatments, but relapses are shorter and less frequent. RP may be better in the long term for maintaining a lower relapse rate because over time people continue to improve as they practice avoiding relapse.[7,8]

CAFFEINE

Coffee and tea are the most common natural sources of caffeine.

Tea is made from the leaves of the *Camellia sinensis* plant, and has been in use in China since about 2700 BCE. The legend is that a servant of the emperor was boiling water for his master when the leaf of an

overhead tree dropped into the water and the emperor decided to taste it.[9]



$(C_8H_{10}N_4O_2)$
caffeine

Fig. 6.1

Coffee is made from the berries of species of the genus *Coffea*, in particular *Coffea arabica* and *Coffea canephora.* One legend says that its stimulant property was discovered by a shepherd, who observed his flock eating the bright red berries and then becoming hyperactive. Coffee has been consumed as a beverage in Middle Eastern cultures since about 1100 CE. When it was introduced to Europe in about 1600, many considered it the "devil's drink" because it was popular in non-Christian societies. Then the pope tried it, and he liked it so much he "baptized" it, removing its alien stigma.[10]

Caffeine is the most widely-used psychoactive substance. Eighty-nine percent of adults in North America use either coffee or caffeinated tea daily, and the average coffee drinker consumes approximately 1,000 cups per year, or about three cups per day. Most people do not think of it as a drug, but caffeine is a powerful stimulant, and although its use is legal, overdosing on caffeine (more than 5 to 10 grams at one time) can be fatal. Caffeine is quite addicting; a tolerance and tendency to increase intake are common, and withdrawal symptoms will occur if consumption is stopped.[11]

Because caffeine makes people feel better in general, it is often included as an ingredient in analgesics (e.g. Anacin, Excedrin) as well as in many cold preparations. Caffeine intake can be estimated using Table 6.1 (keep in mind that caffeine content varies depending on the product used and the method of preparation).

Effects of caffeine

Caffeine causes an increase in cellular activity in the CNS, and behavioral and emotional responses that are similar to, but milder than, the amphetamines and cocaine. After consuming caffeine, people report thinking more clearly, having more energy, and having faster

reaction times.[11] Increases are seen in respiratory rate, amplitude of reflexes, and the rate and force of the heart's contractions (systolic pressure).

Caffeine causes a general *vasodilatation* (opening) of the systemic blood vessels, including the coronary arteries, resulting in an increase in blood-flow to the heart. Duration of systemic vasodilatation is brief and is accompanied by *vasoconstriction* (tightening) of the vessels in the brain.[11] Central vasoconstriction is the mechanism by which caffeine provides relief from both hypertensive and migraine headaches (another reason why caffeine is often found in headache remedies).

Caffeine dependence

People who are caffeine-dependent have a strong association between caffeine consumption and feelings of well-being. Many people enjoy the increased speed of performance and feelings of efficiency caused by caffeine. Regular caffeine consumption causes both psychological dependence and physiological tolerance.[11]

Caffeinism

This disorder is a chronic toxicity caused by high levels of caffeine consumption. It is characterized by:

- disruption of sleep patterns
- nausea
- diarrhea
- headache
- trembling
- dry mouth
- palpitations
- depression
- stomach pain
- feelings of anxiety
- ringing in the ears
- irregular heart beats
- rapid changes in mood

Caffeine withdrawal

The main symptom is headaches, which may continue for up to five days if no caffeine is consumed. These headaches often lead the sufferer to use analgesic preparations which may contain caffeine. This cures the headache, but leads to a continuance of caffeine

dependence. Other symptoms of caffeine withdrawal are:

- apathy
- lethargy
- irritability
- mild nausea
- restlessness
- nervousness
- decreased efficiency
- difficulty concentrating

It is possible to reduce withdrawal symptoms by gradually decreasing the daily intake of caffeine by substituting decaffeinated coffee for regular and increasing the percentage of decaf each day.

Other effects of caffeine

It is important for women to know that caffeine crosses the placenta and gets into the bloodstream of a developing fetus. (No significant correlation between birth defects and caffeine consumption has yet been demonstrated.) It also gets into the breast milk of nursing mothers. In both these cases, the fetus or infant is ingesting a portion of the caffeine consumed by its mother.

Although the specifics are not yet clearly understood, there seems to be some relationship between caffeine and *fibrocystic breast disease*.[11] Decreasing caffeine consumption leads to a decrease in discomfort experienced by women with fibrocystic breast disease. Many studies have been done with large numbers of adults, and no correlation between caffeine consumption and cancer has been substantiated.

One factor that reflects some physiological change in response to caffeine is age. People become more sensitive to caffeine's effects as they get older. It has also been observed that the amount of caffeine in the bloodstream increases when smoking is stopped. This increase in blood level of caffeine will amplify the usual effects of tobacco withdrawal, such as irritability, nervousness, an inability to concentrate,

and sleeplessness.

Studies show a positive correlation between caffeine use and the presence of anxiety disorders. People with anxiety disorders have an increased sensitivity to caffeine.[12] There is marked lessening of symptoms of anxiety with caffeine abstention, and for some people antianxiety medication is not necessary if caffeine use is discontinued.[13] The psychotherapist needs to assess caffeine intake in any patient who presents with symptoms of anxiety.

Caffeine Content

SOURCE	SERVING	CAFFEINE (mg)
coffee (drip)	5 oz.	110–150
coffee (perked)	5 oz.	60–125
coffee (instant)	5 oz.	40–105
coffee (decaffeinated)	5 oz.	2–5
black tea (steeped 5 min.)	5 oz.	40–100
green tea (steeped 5 min.)	5 oz.	50
hot cocoa	5 oz.	2–10
cola beverage	12 oz.	45
milk chocolate	1 oz.	1–15
bittersweet chocolate	1 oz.	3–35
chocolate cake	1 slice	20–30
Anacin, Midol	2 tablets	64
Excedrin	2 tablets	130
NoDoz	2 tablets	200
Dexatrim	2 tablets	200

Table 6.1

Nicotine

The source of nicotine is the tobacco plant, *Nicotiana tabacum,* which is native to the western hemisphere. Tobacco was in widespread use by indigenous peoples throughout the Americas when the first explorers arrived from Europe; its use quickly spread throughout the world.[14]

The use of nicotine is widespread in our society and around the world. Over 25% of American adults (about 50 million people) use tobacco products.[15] Although nicotine is extremely addictive and harmful, its purchase and use by anyone over the age of 18 is legal. If one considers how difficult it is to stop using it, nicotine is even more addictive than opioids. Using nicotine, particularly through smoking, is much more harmful than many other drugs in terms of

number of illnesses it causes, the costs of treating those illnesses, and the high fatality rates. While antismoking campaigns have lowered smoking rates in the U.S., the percentage of people worldwide who smoke is increasing. It is estimated there are more than 430,000 smoking-related deaths every year in the U.S. alone.[16]

Nicotine is the ingredient in tobacco that causes physical dependency, but it is the "tars" that contain the carcinogens. Nicotine consumption causes the release of NE, DA, and 5-HT in the CNS. This leads to feelings of stimulation and calming. Research indicates that part of the calming effect experienced by smokers may be due to the decrease in the unpleasant withdrawal symptoms a habitual user experiences as nicotine levels in the blood drop. When nonsmokers or former smokers are compared to current smokers, indications are that nicotine actually increases stress.[17]

Effects of nicotine

The release of DA is probably what leads to the reinforcing experience of pleasure associated with tobacco (this is similar to other addictive drugs). Nicotine has a half-life of 30 minutes, which leads to an urge to consume more nicotine every half hour. Two cigarettes an hour (or consuming the equivalent form of other tobacco products) will maintain a constant blood level of nicotine.

For reasons that are not yet clear, about 10% of people who smoke do not become addicted. They are able to keep consumption of cigarettes to approximately five per day, as opposed to the one or two packs a day consumed by the addict.[18] MRI and PET scans of drug abusers show that heightened craving is linked to increased activity in the frontal cortex. Drug users who have shown no decision-making impairment may have a lower risk for becoming addicted, and may be able to stop if they want to. This provides evidence that addiction may be related to a disruption to motivational circuits in the CNS, rather than only to pleasure-control centers.[4] These findings may lead to better intervention strategies and help to explain why some

drug users become addicted while others do not.

People who are addicted to nicotine have higher rates of major depression and anxiety disorders than people who smoke but do not become addicted.[19] More research is needed to determine the factors responsible for these differences. One recent study found that 90% of people who attempt suicide are smokers.[20]

Tobacco leaf
Nicotiana tabacum

It is estimated that about 70% of people with schizophrenia smoke; this is a much higher percentage than the general population. There is evidence that cigarette smoking ameliorates the unpleasant symptoms caused by schizophrenia and by antipsychotic medication. Atypical antipsychotic drugs (e.g. risperidone, olanzapine) have been shown to reduce cigarette smoking. The harm reduction approach is the recommended method of treatment for decreasing the use of cigarettes in this population. The use of the nicotine patch or chewing gum, along with buproprion (see below), is recommended for maintenance treatment.[21]

Tars & other compounds found in tobacco products

Some known carcinogens found in tobacco tars include:

- benzopyrenes
- pyrenes
- aromatic amines
- chrysenes
- nitrosamines

There are many other substances known to be harmful to humans that are frequently present in tobacco products, including:

- cresols
- phenols
- metallic ions
- radioactive compounds
- carboxylic acids
- various additives and flavoring agents
- agricultural compounds (e.g., pesticides)

If manufacturers removed these toxic agents from their products the harmful effects of tobacco use would be greatly reduced.

Nicotine withdrawal

Physiological symptoms of withdrawal occur when someone who is addicted to nicotine stops consuming it. This withdrawal syndrome is commonly called a "nicotine fit." Some of the symptoms of nicotine withdrawal are:

- anxiety
- restlessness
- feelings of uneasiness
- headache
- nervousness
- digestive disturbances
- impairment of psychomotor performance
- impairment of concentration and judgement

When the body is under stress, nicotine is depleted faster than usual, causing the addict to consume more to maintain the usual blood-level of nicotine and to ward off symptoms of withdrawal.

Bupropion & naltrexone for nicotine withdrawal

The FDA's Drug Abuse Advisory Council found that the antidepressant bupropion/Wellbutrin/Zyban is safe and effective as an aid in smoking cessation.[22] The drug naltrexone/ReVia, developed for use during opioid withdrawal, has been found to decrease the craving for nicotine. Both of these drugs are helpful as supportive measures in addition to psychotherapy, especially in the early stages of abstinence.

Clonidine for nicotine withdrawal

Another drug that helps with nicotine withdrawal is clonidine/Catapres. Clonidine is an antihypertensive drug that stimulates endorphin production; this leads to an increase in positive feelings. The craving for cigarettes is decreased if clonidine is taken during nicotine withdrawal.

Gamma vinyl-GABA for nicotine withdrawal

The antiepilepsy drug gamma vinyl-GABA/GVG is being tested to decrease nicotine-craving during withdrawal. GVG inhibits release of DA and increases production of GABA. The increased GABA would cause a calming effect.

Patches & gums for nicotine withdrawal

Products such as the nicotine patch and nicotine gum are helpful in helping people gradually decrease tobacco use and quit. Simply trying to "cut down" continues to expose the client to the health risks, and reinforcing behaviors, inherent in tobacco use.

Effect of caffeine during nicotine withdrawal

Caffeine is metabolized more quickly by smokers than by nonsmokers. If someone stops using nicotine, and the amount of caffeine consumed remains constant, the level of caffeine in the blood will double. This will cause an increase in nervousness that makes withdrawal from nicotine even more difficult. For this reason, it is recommended that caffeine consumption be decreased or eliminated during withdrawal from nicotine.[13]

Stimulants for Treatment of ADHD

Using the *DSM-IV* definition, the prevalence of *attention deficit hyperactivity disorder* (ADHD) in the U.S. is between 8% and 16%. Boys are four times more likely to be given this diagnosis than are girls.[23]

Amphetamines & methylphenidate/Ritalin

Methylphenidate was synthesized in the 1940's and marketed under the brand name Ritalin in the 1960's.[24] In the U.S. alone, about 11 million prescriptions are written every year for methylphenidate, and another six million are written for various amphetamine compounds such as Adderall.[25] These drugs are useful in decreasing

manic behavior in hyperactive children and adults. The mechanism for the paradoxical response in these populations (i.e., why taking a stimulant results in a calming) is not fully understood.[26]

When taking methylphenidate, children who were previously unable to concentrate and had difficulty learning were able to perform at their age-appropriate level. Tolerance and dependence do not develop in children who are taking these medications. A slowing of growth has been observed when children take methylphenidate for long periods. To remedy this, children are given "drug vacations" from their medication on weekends, or over the summer when they are not in school. Hopefully, this break allows children to catch up on their growth if it has been slowed due to the medication.

Methylphenidate and amphetamine can be drugs of abuse. They can be dissolved and injected for a rapid effect (drug "rush"). When used in this manner, they have effects like cocaine, but milder. A tolerance develops if they are used frequently in this way, and withdrawal symptoms occur after one has become physically dependent.[2]

Atomoxetine

The drug atomoxetine/Strattera is being used for the treatment of ADHD, but it has not been classified as a stimulant. Since it is not a controlled substance, more doctors are willing to prescribe it. A major advantage of this drug is that it only needs to be taken once in the morning, and its effect lasts until evening without causing insomnia. A 13-item, parent-rated diary was developed by the manufacturer to assess efficacy during the early morning and in the evening. The symptoms evaluated included:

- oppositionality
- hyperactivity/impulsivity
- inattentiveness/distractibility
- inability to concentrate on structured tasks

Atomoxetine was found to be effective in treating these symptoms.[27]

There are indications that a reduction in the dose of atomoxetine may be necessary for patients with impaired liver functions.[28] Now that the drug is on the market and is being used much more widely, additional adverse effects may emerge.

Buspirone

Although it was developed as an antianxiety medication and is not considered a stimulant, buspirone/BuSpar has been found to be as effective as methylphenidate in reducing the symptoms of ADHD, with minimal adverse effects. Some children taking buspirone experienced dizziness during the first week of treatment.[29]

Caffeine & ADHD

There is evidence that caffeine is helpful for children with ADHD, and may be valuable as an alternative to the more potent stimulants.[30]

Opinions differ on whether caffeine use in children is harmful. No long-term studies have been done to assess its effects on physical and psychological function in children. Most children respond to caffeine in the same way as adults. There is a stimulating effect, observed as nervousness, and response time is shortened.[30]

Caffeine has been shown to have the effect of improving functioning and reducing levels of hyperactivity in children with ADHD. Although the traditional treatments with methylphenidate and amphetamines outperform caffeine in improving functioning, caffeine outperforms control groups getting no treatment. Improvements are seen in relationships with parents and teachers; also seen are reduced levels of aggression, impulsiveness, and hyperactivity, and an improvement in executive functioning.[30]

Caffeine may be a tolerable option for parents who are opposed to the use of other stimulants due to fear of long-term adverse effects on their children.

Stimulants for Treatment of Depression

Because of fears of their addictive potential, the amphetamines and methylphenidate are not frequently prescribed to treat depression, but they may be appropriate for short-term use.[31] Stimulants can be useful for treating depression when apathy and lack of motivation are present. These drugs can help getting someone launched on a regime of exercise and constructive activities that will support the maintenance of an elevated mood. Their virtue is that while most antidepressants take several weeks to reach their maximal effect, these drugs act immediately. Immediacy can be critical if a patient is suicidal. People who have no history of addiction usually do not become addicted when taking these drugs for therapeutic purposes.[32] It is the immediacy of response which also makes stimulants potential drugs of abuse.

Direct Relevance to Psychotherapy

It is very important to be aware that a paranoid psychosis may result from long-term use of stimulant drugs (particularly with amphetamines or cocaine). This drug-related condition is often clinically indistinguishable from the paranoid psychosis seen with schizophrenia or during a manic episode. The symptoms include:

- hostility
- paranoia
- delusions
- aggressiveness
- disorganized thought patterns
- hallucinations (usually auditory)

These psychotic symptoms occur most often when there is a sudden increase in dosage or in chronic users of amphetamines who are taking more than 100 mg/day. The treatment of choice for this drug-induced psychosis is to stop stimulant use and begin a course of antipsychotic medication. Recovery from a drug-induced psychosis is not always

immediate; it may take days or weeks to clear. In some cases, the psychosis may last for years and require continuing the antipsychotic medication. Autopsy results show that heavy amphetamine use can cause permanent brain damage.[33]

Each therapist's family history and personal experiences with smoking and the diseases it causes will strongly influence his or her feelings about tobacco and its associated ills. There is no denying that tobacco use is a health hazard. Consumption of nicotine, like any other addictive drug or unhealthy habit, deserves exploration in therapy. For clients who want to stop, cognitive and behavioral interventions have proven to be most effective for changing habits. The psychotherapist can discuss with the client whether a medication like bupropion or naltrexone might be desired in addition to psychotherapy. Studies demonstrate that using a nicotine patch in conjunction with bupropion while continuing therapy results in significantly higher long-term rates of cessation than the use of either of these alone.[22]

References for Chapter 6

1. Stahl, S. M. (1999). Awakening to the psychopharmacology of sleep and arousal: Novel neurotransmitters and wake-promoting drugs. *J. Clinical Psychiatry*, 63(4), 339-402.
2. Chiang, W. K., MD & Goldfrank, L. R., MD. (1990). Substance withdrawal. *Emergency Medicine Clinics of North America,* Aug., 8(3), 613-614.
3. Methamphetamine information: History of methamphetamine. Retrieved Dec. 7, 2003, from http://www.narconon.org/druginfo/methamphetamine_hist.html
4. Johnson, B. A. (2000). Ondansetron for reduction of drinking among biologically predisposed alcoholic patients. *JAMA,* 284(8), 36.
5. Krol, C. (2003). The coca plant. Retrieved Dec. 7, 2003 from http://www.siu.edu/~ebl/leaflets/coca2.htm
6. Sussman, E. (1997). Cocaine vaccine is almost ready for the market. *Psychopharmacology Update,* 8(2), 1, 7.
7. Foxhall, K. (2001). Preventing Relapse. *Monitor on Psychology*, June 46-47.
8. Carpenter, S. (2001). Mixing medication and psychosocial therapy for alcoholism. *Monitor on Psychology*, June, 36-37.
9. Golender, L. & Beuquet. (2003). History of Tea: Botanics. Retrieved Dec. 7, 2003 from http://www.geocities.com/lgol27/HistoryTeaBotanics.htm

10. The coffee plant: Tree to cup/Harvesting. Retrieved Dec. 7, 2003 from http://www.realcoffee.co.uk/Article.asp?Cat=TreeToCup&Page=1
11. Hughes, J. R., Higgins, S. T., Bickel, W. K., Hunt, W. K., Fenwick, J. W., Gulliver, S. B. & Mireault, G. C. (1991). Caffeine self-administration, withdrawal, and adverse effects among coffee drinkers. *Archives of General Psychiatry*, 48, 611-617.
12. Charney, G. S.; Henninger, G. R. & Jatlow, P. I. (1985). Increased anxiogenic effects of caffeine in panic disorders. *Archives of General Psychiatry,* 42, 233-243.
13. Bruce, M. & Lader, M. (1989). Caffeine abstention in the management of anxiety disorders *Psychological Medicine*, 19, 221-214.
14. Borio, G. (2003). The history of tobacco: Part 1. Retrieved Dec. 7, 2003 from http://www.historian.org/bysubject/tobacco1.htm
15. Wetter, D. E., Fiore, M. C., Gritz, E. R., Lando, H. A., Stitzer, M. L., Hasselblad, V. & Baker, T. B. (1998). The agency for health care policy and research, smoking cessation clinical practice guideline, findings and implications for psychologists. *American Psychologist*, 53(6), 657-669.
16. *Morbidity and Mortality Weekly Report*. (1997). 46(20), 444-451.
17. Parrott, A. C. (1999). Does cigarette smoking cause stress? *American Psychologist,* 54(10), 817-820.
18. Breslau, N., Kilbey, M. & Andreski, P. (1991). Nicotine dependence, major depression and anxiety in young adults. *Arch. Gen. Psychiatry*, 48, 1069-1074.
19. Walton, R., Johnstone, E. & Munafo, M. (2001). Genetic clues to the molecular basis of tobacco addiction and progress towards personalized therapy. *Trends Mol. Med.*, 7(2), 70-76.
20. Leistikow, B. N., MD, MS, Martin, D., Jacobs, J., MD, MPH, & Sherman, C., PHD. (1996). A meta-analysis of the prospective association between smoking and suicide. *J. Addictive Diseases*, 15, 141.
21. McChargue, D. E., PHD., Gulliver, S. B., PHD. & Hitsman, B., PHD. (2003). Applying a stepped-care reduction approach to smokers with schizophrenia. *Psychiatric Times*, Sept., 78.
22. Jorenby, G. B., Leischow, S. J., Nides, M. A., Rennard, S. I., Johnston, J. A., Huges, A. R., Smith, S. S., Muramoto, M. L., Daughton, D. M., Doan, K., Fiore, M. C. & Baker, T. B. (1999). A control trial of sustained-release bupropion, a nicotine patch, or both for smoking cessation. *New England Journal of Medicine*, 340, 685-691.
23. Wender, E. H. (2002). Attention-deficit/hyperactivity disorder: Is it common? Is it overtreated? *Arch. Pediatr. Adolesc. Med.*, 156, 209-210.
24. History of methylphenidate. Retrieved Dec. 7, 2003 from http://www.repsych.ac.uk/traindev/epd/adhd/drug/mpd1.htm
25. DEA Congressional Testimony, Caucus on International Narcotics Control, July 25, 2000, Fiano, R. A. US Dept. of Justice, Drug Enforcement Administration.
26. Gainetdinov, R. R., Wetsel, W. C., Jones, S. R., Levin, E. D., Jaber, M. & Caron, M. G. R. (1999). Role of serotonin in the paradoxical calming effect of psychostimulants on hyperactivity. *Science*, 283(5400), 397-401.
27. Michaelson, D., Adler, L., Spencer, T., Reimherr, F. W., West, S. A., Allen, A. J., Wernicke, J., Dietrich, A. & Milton, D. (2003). Atomoxetine in adults with

ADHD: Two randomized, placebo-controlled studies. *Biol. Psychiatry*, 53(2), 112-20.
28. Chalon, S. A. (2003). Hepatic impairment with atomoxetine. *Clin. Pharmacol. Ther.*, 73, 178-91.
29. Malhotra, S. & Santosh, P. J. (1998). An open clinical trial of buspirone in children with attention-deficit/hyperactivity disorder. *J. Am. Acad. Child Adolesc. Psychiatry,* 37, 364-71.
30. O'Connor, E. (2001). A slip into dangerous territory. *Monitor on Psychology*, June, 60-62.
31. Wagner, J. G., Rabkin, J. G. & Rabkin, R. (1997). Dextroamphetamine as a treatment for depression and low energy in AIDS patients: A pilot study. *Psychosomatic Research,* April, 42(4), 407-11.
32. Satel, S. L. & Nelson, J. C. (1989). No reports of addiction using stimulants under medical supervision. *J. Clin. Psychiatry*, July 50(7), 241-9.
33. Eisch, A. J., Schmued, L. C. & Marshall, J. F. (1998). Characterizing cortical neuron injury with fluro-jade labeling after a neurotoxic regimen of methamphetamine. *Synapse*, 3, 329.