

AMPHETAMINES AND OTHER STIMULANTS

HISTORY

The term "Amphetamine" refers to a group of chemically related drugs, all of which produce behavioral (the way someone acts) and physiological (physical functions of the body) effects. Every drug in the amphetamine group is a psychostimulant (a drug that increases the activity of the brain). Unlike many other frequently abused drugs, amphetamines are not natural, but can only be made in a chemical laboratory (Lukas, 1989, p. 9).

Amphetamines were originally made in 1887 by a German scientist. They were forgotten until 1930 when it was discovered that they could increase a person's blood pressure. Three years later, it was found out that amphetamines were helpful in treating lung congestion. In 1932, a pharmaceutical (drug) company sold a nasal inhaler containing amphetamine. At the time, the powerful stimulating effects of amphetamine, when taken internally (inside) were unknown (Lukas, 1989, p. 9).

Between 1932 and 1946, the pharmaceutical (drug) industry developed a list of 39 uses for amphetamines. Some of these uses included the treatment of morphine and codeine addiction, tobacco smoking, heart block, head injuries, low blood pressure, and seasickness. Amphetamine was said to be effective without the risk of addiction. Since nearly every abused drug was first thought to be "non-addictive," this claim is not surprising and it is very wrong. Over the last 40 years, however, amphetamine use has changed. Amphetamine, or the "Pep Pill," was used by the military during World War II. It is guessed that around 200 million pills were given to American troops. Many of these soldiers that had used amphetamine during the war, returned to the U.S. to spread the news of this invigorating (exciting) drug. By the 1950's, college students, athletes, truck drivers, and housewives, in addition to soldiers, were using amphetamine for non-medical purposes. Use of amphetamine spread all across the U.S. as its production increased. It was being sold to treat obesity (fatness), narcolepsy (sleeping disorder), and depression, but people were taking it primarily to increase energy, decrease the need for sleep, and elevate (raise) mood. By the 1960's, some people began using amphetamine intravenously (shooting in the veins). At this time, heroin addiction was being treated with intravenous amphetamine, making amphetamine in injectable form readily available (Lukas, 1989, p. 9).

The 1960's were the peak of the speed (a street name for amphetamines) craze; however, the Controlled Substance Act of 1970 made it hard to buy amphetamines legally. A cap was put on the prescription use of these drugs. This made the street market grow to fill the need for continued production. Instead of buying legally manufactured amphetamines, people bought speed and crank that had been manufactured illegally (Inaba & Cohen, 1990, p. 70).

The late 1980's saw a rise in the availability and the abuse of these illicit (unlawful) amphetamines, particularly "crank" (methamphetamine sulfate) and "crystal" (methamphetamine hydrochloride - not to be confused with "angel dust" which is PCP). Once slowed down by the tight control of chemicals needed to produce illegal amphetamines, clever street chemists now change commonly available compounds and even use aluminum foil to produce "speed" products. A recent survey of street meth showed that 90% of the supplies were really "look-alike" drugs such as phenylpropanamine (a decongestant), ephedrine (allergy medication), or simply caffeine tablets (Inaba & Cohen, 1990, p. 70).

Amphetamine is a stimulant. Stimulants ("uppers") refer to several groups of drugs that tend to increase alertness and physical activity. Some people use stimulants to fight or defeat the

drowsiness or "down" feeling caused by sleeping pills or alcohol. This up/down cycle can be extremely dangerous on the body. Amphetamines, Cocaine, Preludin, Ritalin, Nicotine, and Caffeine are all stimulants. Stimulants, simply speaking, can be divided into three strengths or levels: high, medium, and low potency. Of course, the dose, mental state of the user, and individual personalities do make a difference in the potency (strength) of all drugs (FBP, 1991, p. 2).

STUDY QUESTIONS

1. **What group of drugs does amphetamines belong to?**
2. **Amphetamine is a naturally occurring drug. TRUE or FALSE?**
3. **When was amphetamine first made, and when did it come into medical use?**
4. **What were some of the early medical uses of amphetamines?**
5. **How addictive was amphetamine thought to be at first?**
6. **What effect did WWII have on amphetamine use in America?**
7. **The controlled substance act of 1970 did what to the amphetamine market?**
8. **Generally, stimulants can be divided into three groups: _____, _____ and _____ potency.**

LOW-POTENCY STIMULANTS

TOBACCO

Tobacco contains an addictive drug called nicotine, and is such a great health problem in the United States (it contributes to 390,000 deaths each year) that it deserves its own program. At this point, it should be said that it is considered to be a low-potency stimulant as far as the central nervous system is concerned. It has bad effects on the heart and circulatory (blood vessel) system, and is a leading cause of heart attacks, strokes, and arteriosclerosis (hardening of the arteries). It also damages the lungs, and is the major cause of lung cancer and emphysema (breathing disorder) (FBP, 1991, p. 2).

CAFFEINE

Caffeine is a stimulant found in several plants, including coffee beans, tea leaves, cola beans, and to a lesser degree; the cacao bean which is used to make chocolate. It is chemically similar to theophylline, an asthma (breathing disorder) medicine, and to theobromine, the main stimulant in chocolate. It also comes in an over-the counter form of straight caffeine, sometimes called

"NoDoz" or "Vivarin" (FBP, 1991, p. 2).

COFFEE

The history of coffee dates back many centuries. The earliest reference to coffee dates back to an Arabian medical book written around 900 A.D. Coffee was first grown as an aide to help you stay awake and for religious prayers, mainly for its stimulating effect. In 1600, owning or visiting a coffee house in the Moslem Eastern Mediterranean was punishable by death. Conservative Moslems viewed coffee as intoxicating, and therefore it is forbidden by the Koran (The Moslem Bible). This sentence was also made into law to scatter politically upset people who frequently held their meetings in coffee houses. The prohibition was eventually lifted. The use of coffee spread to other parts of Europe in the early 1600's. There were occasional attempts to prohibit coffee, again, in part due to the fact that coffee houses were seen as places where news and anti-government agitation occurred. It has been in the U.S. for many years and it is a widespread addiction for many people (FBP, 1991, p. 2,3).

TEA

Tea also contains caffeine, but in lower doses. It was mentioned in a Chinese manuscript (book written by hand) around 350 A.D., but did not become a world-wide drink until the early 1600's. Tea was involved in the American Independence Rebellion, when an import tax on tea was one of the complaints against the British in the mid-1700's. Although much of America's tea was then smuggled into the colonies, coffee was seen as a more patriotic (one who loves his country) drink at that time. To this date, more coffee than tea is drunk in America, while the reverse is true in England. Iced tea was introduced in 1904 for the first time at the St. Louis World's Fair (FBP, 1991, p. 3).

COLA

The main source of caffeine for soft drinks, is the cola nut. The original Coca-Cola also contained cocaine, but it has been removed (FBP, 1991, p. 3).

CHOCOLATE

Chocolate comes from the beans of the cacao tree. Cocoa is the powder made from the cacao beans after they have been roasted. The average cup of cocoa contains some caffeine (10 mg.) and a larger amount (200 mg.) of a related drug called theobromine. Theobromine is much less potent in the central nervous system than caffeine, but it does produce some increase in heart beat and relaxes the intestines (this is why chocolate acts like a laxative in some people) (FBP, 1991, p. 3).

OVER-THE-COUNTER DRUGS

Many of the drugs sold in stores contain large amounts of caffeine. The largest doses are found in Vivarin or NoDoz which are sold to help people stay awake. Many other medications such as headache pills, water-loss pills, and cold remedies contain large amounts of caffeine. Buyers should read the ingredients of any medicine that they take (FBP, 1991, p. 3).

DOSES (AMOUNT) IN VARIOUS PRODUCTS

An average cup of tea contains between 40 and 70 mg. (milligrams) of caffeine. An average cup of coffee (not decaffeinated) contains between 65 and 115 mg. A chocolate bar contains about 20 mg. A cup of cocoa contains about 4 mg. American soft drinks with caffeine in them contains between 36 and 59 mg. of caffeine. An over-the-counter stimulant, Vivarin, Contains 200 mg. The danger with caffeine in pill form is that people will overdose by mistake (FBP, 1991, p. 3).

PHYSICAL EFFECTS OF CAFFEINE

The effects of a dose of caffeine begin within half an hour, and peak within two hours. Half of the caffeine is metabolized (chemically changed) by the body in three hours. There is a tolerance limit built up with steady users. Steady users need two to four times their first dose for the same effects. The lethal dose is about 10 grams (10,000mg) (FBP, 1991, p. 4).

Caffeine blocks the brain's receptors from a chemical (adenosine) that acts to slow down arousal. This prevents the release of the brain's own stimulant chemicals. Thus, when a person takes caffeine, more of the brain's stimulant chemical (adrenaline) is sent to other brain cells. Caffeine causes increased brain wave activity, and more adrenaline is released in the body. Sleep is disturbed, and at higher doses, breathing rate and perspiration (sweating) is increased. The rate at which the body burns food increases, and fatigue (being tired) is reduced (FBP, 1991, p. 4).

Caffeine has a helpful effect for people suffering from forms of headaches, which are related to expanded arteries leading to the brain. Caffeine constricts (shrinks) these blood vessels and eases the pain. If a person takes caffeine regularly and then stops (for examples on weekends), it is common for a headache to occur. This is considered a physical withdrawal symptom (FBP, 1991, p. 4).

Harmful effects are also reported in people who use caffeine. High doses of caffeine have much the same effect as other stimulants such as amphetamines and cocaine, and can lead to a paranoid psychosis (sickness of the mind). This takes about 1 gram in one dose; or repeated use of fairly high doses of coffee. However, even moderate doses can lead to nervousness, irritability, insomnia (inability to sleep), and possibly ulcers. People with psychiatric problems can lose control when using any stimulant, including caffeine. People who are troubled with panic or anxiety attacks can bring on an attack with too much caffeine (FBP, 1991, p. 4).

Caffeine has been found to produce birth defects and problems in bone development when high dose are fed to pregnant rats. However, this has not been verified in humans at lower doses. It would be wise, however, for a pregnant women to avoid using much caffeine, or any other drug (FBP, 1991, p. 4).

It is also worth noting that when rats are fed large doses of caffeine they become highly aggressive, launch unprovoked (not caused) attacks on other rats, and even become self-mutilating (causing wounds to themselves). In summary, caffeine, although it is legal, is a low potency stimulant that must be used in moderation (not extreme) (FBP, 1991, p. 4).

STUDY QUESTIONS

- 1. In what common foods & drinks can caffeine be found?**
- 2. Why do Americans drink more coffee than the British?**

3. **What does caffeine do in the brain?**
4. **What are caffeine's effects on the body?**
5. **Why do coffee drinkers often get headaches on the weekends?**
6. **What can high doses of caffeine do to pregnant rats?**

MID-POTENCY (MIDDLE STRENGTH) STIMULANTS

STRYCHNINE

Strychnine is used as a rat poison, as it causes death by convulsions. In the past, small doses were used as a stimulating tonic. However, because of the danger of a fatal (life ending) overdose, this drug is not used for humans. Unfortunately, some unscrupulous drug dealers have added strychnine to batches of stimulants or hallucinogens to increase the effect. This is very dangerous, and demonstrates (shows) the danger of the illegal drug market (FBP, 1991, p. 5).

RITALIN AND CYLERT

During the 1950's and 1960's, long-term amphetamine use was discouraged (not recommended) for use with hyperactive (excessively active) children who had attention deficits (shortages). Two non-amphetamine stimulants, methylphenidate (Ritalin) and pemoline (Cylert), were introduced as amphetamine substitutes to help treat the hyperactivity. These drugs differ only slightly in their chemical structure from amphetamines, and probably work the same way. They have generally been considered less potent forms of stimulants, although dosage (amount) level is an important factor as with any drug (FBP, 1991, p. 5).

PRELUDIN

The stimulants of mid-level strength also include phenmetrazine (Preludin). Preludin, whose is nicknamed "bam," is a diet pill which was popular in Washington, D.C. during the 1970's and early 1980's. Heroin addicts mixed their opiates with "bam" to make a form of speedball. Preludin was also dissolved with heat and water and injected alone for the stimulant properties. Preludin has been prescribed mostly as an appetite suppressant to reduce hunger (FBP, 1991, p. 5).

STUDY QUESTIONS

1. **Small doses of what poison are stimulating?**
2. **What two mid-potency non-amphetamine stimulants were developed in the 1950's & 1960's for hyperactive children?**
3. **Preludin has been mainly used as an _____.**

HIGH-POTENCY

COCAINE

Cocaine is probably the most addicting stimulant, both because it is more euphoric (pleasant-feeling) and because it wears off quickly so that people who use it tend to use it so often. Because it is so widely abused, it is discussed in a separate unit (FBP, 1991, p. 6).

AMPHETAMINES

The most potent stimulants are the amphetamines. These high potency stimulants generally include three closely related drugs: amphetamine, dextroamphetamine, and methamphetamine. Their street names include ice, speed, crank, meth, monster, white crosses, uppers, dexies, bennies, black beauties, and yellows. In pure form, they are yellowish crystals that are manufactured in tablet or capsule form. Abusers also sniff (snort) the crystals (although this is painful), or make a solution and inject it (FBP, 1991, p. 6).

There is no apparent difference between amphetamine, methamphetamine and dextroamphetamine to the user. They differ in potency (strength), with methamphetamine being the strongest, and dextroamphetamine having the fewest side effects. The stimulating properties of amphetamines was first put to use beginning in the 1930's. The German Army handed out amphetamines to soldiers for Blitzkrieg (lightning-fast) warfare, in which they overwhelmed the opposition (enemy) with fighting lasting for days. Amphetamines helped the German soldiers stay awake; although, later they had to recuperate (recover). As was mentioned earlier, amphetamines were used by all sides during the second World War, and after the war Japan had to deal with a large part of its population who were abusing it. It has commonly been reported that soldiers were given amphetamines to overcome combat fatigue (tired) during the Vietnam Era (FBP, 1991, p. 6).

Medically, amphetamines were used in inhalers as decongestants, and for asthma. Now, better drugs have been found for these illnesses. Amphetamines (primarily dexedrine, methedrine, dexamyl, and benzedrine) were widely used for weight control, but it was found that the weight loss was only temporary. These days it is not approved for weight control unless other methods have been tried with no success. An additional use of amphetamines is in the treatment of narcolepsy (sleeping too much), and hyper activity in children. These stimulants act as sedatives (drugs that calm). Both of these uses are still considered legitimate by the medical community. Amphetamines have also been used to treat low blood pressure and to reduce fatigue (tiredness). This last use is still being argued by doctors (FBP, 1991, p. 7).

Methamphetamine was most commonly "snorted," injected alone or mixed with heroin during the 1960's and 1970's. The drug, which was made in illegal laboratories or extracted from legally purchased inhalers, was commonly referred to as "crank" or "monster" and was popular in certain parts of the United States, particularly around Philadelphia. Amphetamines replaced cocaine in 'speedballs' because of the relatively low cost and length of the high. Use and production of amphetamines was commonly associated with motorcycle gangs/clubs (FBP, 1991, p. 7).

ICE

During the 1980's, amphetamine use was largely replaced by cocaine or crack abuse. More recently, a smokable form of methamphetamine, called "ice," has surfaced (shown up) in Hawaii. Because of its low cost and much longer length of the high, it could replace cocaine as the drug of choice for many. In Hawaii, there are two "meth" narcotics cases for every cocaine narcotic case. The problem with amphetamines seems to be getting worse as shown by the 75% increase in reported cases of abuse from 1988 to 1989. Methamphetamines are reportedly being shipped into Hawaii from the Orient, possibly Korea, Hong Kong, or the Philippines. The drug was

supposedly first popularized in Hawaii by Philippine youth gangs. It is now popular among a wide section of the population in Hawaii (FBP, 1991, p. 7,8).

"Ice," "glass," and "speed," are nicknames for methamphetamine. Crystal methamphetamine is also produced legally by Abbot Laboratories under the brand name "Desoxyen," and is a schedule II drug (available by prescription, vault type security, registration with the DEA). This drug is available in a small white pill with the letters "ME" stamped on one side of the pill and what appears to be a reversed "a" on the other side. The illegal market manufactures meth in secret laboratories. Crystal meth is normally a white powdery, or crystal-like substance. Although this drug has been snorted, injected, or swallowed for a number of years, the drug is now reportedly being smoked in the Orient and now Hawaii. Reports from Hawaii show that 1 gram of ice can be divided into 10-15 "hits" or doses, and that a .10 of a gram, or an effective dose, sells for as little as \$50.00. The effects may last up to 14 hours, depending on the amount and how pure it is (FBP, 1991, p. 8).

There are reports from Hawaii concerning two types of street meth: a water-based and an oil-based version. The water-based type looks like and is formed in the same manner as rock candy. It burns more quickly than the oil-based type, and leaves a white residue in glass pipes where it is heated into fumes which are inhaled. The oil-base version is a yellowish oil which is skimmed from the top of a heated mixture of meth and baking soda, and then cooled in freezers. This type of meth burns slower than the water-based version, and leaves a charred residue in the pipes. The type of pipes preferred have reportedly been six inch glass, with rounded and enlarged ends to help cool the gas. A 1/2" diameter hole through which the raw meth is dripped is covered by the finger once the meth has been heated into gas. A wet towel is sometimes used to cool the pipe for storage or further use. The user's fingertips are sometimes burned by the hot glass when the hole through which the meth was dropped, is covered to prevent loss of the gaseous vapor (FBP, 1991, p.).

ORIGIN AND COMPOSITION (Make-Up)

Amphetamines are chemically similar to our body's own arousal (exciting) hormones called adrenalin (epinephrine), and noradrenalin (norepinephrine). These drugs are suspected of mimicking (copying) or boosting the body's own natural stimulants. Amphetamine is less potent than dextroamphetamine, which is likewise less potent, gram for gram, than methamphetamine (FBP, 1991, p. 8).

Most of the illegal amphetamines in this country come from illegal laboratories. A small amount of these drugs are diverted from prescription sources. There are also drugs which resemble (called "look-alikes") stimulants. These drugs contain legal substances like caffeine, and are sold in "head" shops. In order to increase profits (money earned from selling), illegal amphetamines are often "cut" or mixed with other drugs. Some cuts of ten used are procaine, a local anesthetic (pain-killer), or other powdered substances such as strychnine, a rat poison (FBP, 1991, p. 9).

ICE, A DRUG OF DECEPTION (FALSE IMPRESSION)

Perhaps the greatest feeling caused by ice isn't the intensity of the high it produces, but the sense of well-being it creates. A February 1990 article in Rolling Stone magazine sums it up well, "Ice is not a drug that makes you high. It doesn't make you drunk like alcohol, or stoned like pot. It doesn't give you a rush, take you on a trip, or even bend reality. In the beginning, before the toxic effects build, the thing that ice does is make you feel bright, awake, and happy. You feel good about yourself, no matter how bad things may be" (Rolling Stone, Feb. 1990).

Chemically, ice is a very simple and dangerous recipe. Ice is manufactured in portable (easily moved) laboratories. These clandestine (secret) or clan labs are now mostly in the western part of the United States, but are moving eastward. These labs are often in trailers, mobile homes, and hotel rooms (Nuckols, 1990, p. 11).

For the cooks, those who make ice, the preparation is extremely dangerous. Acid fumes can be inhaled, and the possibility of explosion creates tremendous danger, not only for those in the labs, but in the immediate area. The cooks use an unpublished "cook book" that lists ingredients for making methamphetamine (or ice), and gives instructions for cooking time and temperature. Anyone with a basic knowledge of chemistry can learn to follow the recipe and successfully produce ice. Just as in any trade, it is common for a cook to serve an apprenticeship with a more experienced cook. Over time, the apprentice (learner) becomes experienced enough to open his own shop or ice kitchen (Nuckols, 1990, p. 11).

THE ECONOMICS OF ICE

After ice is manufactured, it is usually sold by street drug dealers. During the 1960's and 1970's in the United States, most methamphetamine distribution was under the control of several large motorcycle gangs. Now ice's distribution has shifted. An Asian underground has made itself the primary source of ice distribution in this country. When consumers (buyers) purchase ice, they get an amount of crystal that today ranges from \$50 for one-tenth of a gram, all the way to \$300 to \$500 for one gram (Nuckols, 1990, p. 12).

ICE: THE QUICK ADDICTION

With ice, we see a much more accelerated (quicker) addiction pattern as well as a greater danger for lethal overdose. Currently, many users say that they are addicted to the substance within two to three months of heavy smoking. They also report a immediate love affair with ice. Beginning with their first hit, it gives an immediate compulsion (overwhelming desire) to keep using the drug. Ice has an appeal for those in the workplace. Some reasons why employees often give for using ice in the workplace are to stay awake, stay alert, fight boredom, cope with stress and pressure, and improve their work output. At first, the drug seems to help their job performance. Someone using ice on the job can often go undetected for several months (Nuckols, 1990, p. 12,13).

PHARMACOLOGY (STUDY OF DRUGS AND THEIR EFFECTS) OF ICE

A very small dose of ice, one-tenth to one-fifteenth of a gram, makes the user more awake and more alert. At first, the user experiences mood elevations, improved self-confidence, and greater ability to concentrate. Since users think that their mental and physical performance has improved, they continue to use methamphetamine. After a while, users continue to feel more productive and efficient even though they are actually worse in all areas. What begins as desirable effects, turns into an illusion (bad dream). Long-term use of ice is usually followed by severe periods of mental depression, paranoia, and possible self-destructive behavior. The user who suffers from (poisonous) effects of smoking ice experiences increased pulse rate and blood pressure, arrhythmia (a change in rhythm of the heartbeat), and angina-type chest pains. Effects on the central nervous system may be relentless insomnia (inability to sleep), fever, and euphoria (great feelings of pleasure). Confusion, combativeness, increased libido (desire for sex), anxiety, paranoia, hallucinations, panic states, suicidal, and homicidal tendencies (wanting to kill) can also happen (Nuckols, 1990, p. 14).

Following long term use of ice, the user is usually fatigued (tired) and depressed. Signs of chronic (habitual) toxicity (using too much) include anorexia (disease suffered from not eating, extreme skinniness), nausea, vomiting, diarrhea, and sleeping problems. Irregular mental conditions are much more common with chronic use. When a person goes on an ice binge, he or she may stay up for a period of time ranging from several days to over a week, using nothing but ice. Users will not eat during this time. Hallucinations and paranoid thoughts such as schizophrenia (loss of contact with reality) are the most serious psychological effects. Some users have hallucinations of bugs or worms crawling under their skin. There are several types of paranoid delusions that can occur in ice users, including:

- * A delusion of persecution, that feeling of "someone is out to get me."
- * A delusion based on jealousy - paranoid delusion in which users accuse a loved one of infidelity (cheating on your partner).
- * An erotomaniac delusion. Users think someone is in love with them, or has a strong sexual attraction toward them. Erotomaniac delusions sometimes result in users committing rape (Nuckols, 1990, p. 14).

PROBLEMS RESULTING FROM ICE

Users of ice sometimes have similar symptoms to those suffered by people with heart disease. In particular, pulmonary edema, a condition in which fluid fills the lungs. Transient hypertension, or high blood pressure induced by amphetamines may lead to bleeding in the brain or a stroke. Hypersensitivity (highly sensitive) to ice has also resulted in cerebral (brain) vasculitis, the shrinking of the brain's arteries. These medical problems are typically associated with older people, but for chronic users of a drug like ice, these symptoms can show up in their mid-twenties to early thirties. Many chronic users have suffered heart attacks; amphetamine abuse speeds up the aging process in the heart vessels (Nuckols, 1990, p. 15).

The toxic (poisonous) dose of amphetamine varies from person to person. Toxic effects may occur with doses as small as two milligrams. The lethal dose of ice isn't known. It is estimated to be in the range of 20-25 milligrams per kilogram of body weight. This would be about 1,500 milligrams for a 70 kilogram (154 pound) man. The toxic dose can alternate for an individual from one day to the next. Though a person can smoke a large amount of ice in one day without toxic difficulties, the same person smoking the same amount the next day may be overcome by toxic effects. This is known as kindling. Kindling is a form of reverse tolerance to effects of a drug. A person may be able to tolerate a large amount of ice one day, the same amount the next day could send the person into convulsions. What it boils down to is simple, the user can never be sure what will happen. While fatal poisoning from ice hasn't yet occurred in great numbers, we can expect to see an increase in overdose deaths. As more people begin using the drug and the strength and the purity of the drug increase, we will see the death count climb. Homicide, suicide, and accidental death as a result of ice usage will undoubtedly claim far more lives. Overdose will rank 4th in this destructive deadly list (Nuckols, 1990, p. 15).

DOSAGE AND PATHWAY OF INTAKE OF AMPHETAMINES

Four methods have been used to put stimulants into the body. In order of increasing strength, these methods are:

- 1.) Orally, by swallowing a pill or capsule. Because of the extremely bitter taste of amphetamines, they are usually put in a gelatin capsule, or in a piece of paper when taken orally. This route is fairly popular because of the pain or danger

- of injecting, or smoking the caustic (burning) drug (FBP, 1991, p. 9/Inaba & Cohen, 1990, p. 71).
- 2.) Snorting, or absorption through out the nasal membranes/sinus cavities. Snorting "meth," done the same way as cocaine, is not as popular as taking it orally because of the extreme irritation it causes to the nasal mucous (inside the nose) (FBP, 1991, p. 9/Inaba & Cohen, 1990, p. 71).
 - 3.) Injection into a vein. Amphetamines usually cause pain in the blood vessels when used intravenously. When injecting amphetamines, the user must deal with all the risk of contaminated needles. Injecting does put large quant into the bloodstream, and causes a more intense "high" than snorting or swallowing (FBP, 1991, p. 9/Inaba & Cohen, 1990, p. 71).
 - 4.) Because of the limiting effects, users have taken to smoking crank of crystal (ice), as a potentially more seductive method of use than the other ways. The technique of smoking the drug is similar to smoking freebase cocaine (in a pipe). Smoking gets the drug to the brain faster (FBP, 1991, p. 9/Inaba & Cohen, 1990, p. 71).

It takes about three minutes for the user to achieve a high by snorting, one-half minute by injection, and a few seconds by smoking. The intensity (strength) of the high is affected by the amount and purity of the stimulant, the route of administration (the way users take in the drug), the speed that it enters the brain, and the user's current tolerance to it. Generally, a dose of 10 to 30 milligrams of dextroamphetamine and even less methamphetamine will last six to eight hours, producing alertness, hypervigilance (over watchfulness), and excitability. The standard dose of ice is .10 grams (100 milligrams). At this dose, the user gets high in about six seconds and stays high for bout twelve hours (Nuckols, 1990, p. 7/FBP, 1991, p. 9).

PHYSICAL EFFECTS OF AMPHETAMINES

The brain is made up of specialized cells called neurons. These neurons work as relay stations which regulate the various activities of the body. The different areas of the brain are interconnected by a set of neural axons. Messages are transmitted along these axons and the message is chemically transferred between neurons. The chemicals used in this process are called neurotransmitters because they transmit or communicate between neurons. The chemicals that are naturally produced in the brain are nonadrenalin and dopamine. When amphetamine comes in contact with the neuron axon, an excess of these chemicals is released, causing a stronger effect (Lukas, 1989, p. 14).

Another chemical called norepinephrine (arousal hormone) is released along with the other two chemicals. Like the two chemicals listed above, amphetamine use increases the release of this chemical, and it also prevents the breakdown of it; therefore, the chemical stays active for a longer period of time in the body. These effects last for hours, it means that energy supplies are continually being squeezed from the nerve cells and released. Extended use or the use of large quantities of amphetamines can severely deplete (lessen) those energy supplies. Continued use of amphetamines can lead to extreme depression and lethargy (exhaustion of the body and mind; drowsiness). Chronic food and sleep deprivation (not sleeping), in addition to the depletion (reduction) of neurotransmitters, prod schizophrenic-like (disconnect from reality) behavior pattern characterized by paranoia. Amphetamine psychosis is very difficult to distinguish from a schizophrenic (mentally unaware of reality) psychosis (FBP, 1991, p. 9,10/Inaba & Cohen, 1990, p. 72).

The effects of amphetamines on the heart and blood vessels depend upon the dose taken. After small doses of five to ten milligrams of amphetamine, blood pressure is increased. The higher blood pressure is sensed by the brain, which in turn sends signals to the heart, causing it to beat

more slowly. Doses of amphetamine greater than twenty-five milligrams, act directly on the heart to increase the heart rate and the force of the contraction (heartbeat). It is this effect that many individuals identify as a pounding of their heart. Irregular heart beats can also occur, but usually only after high doses such as 100 milligrams. Extremely high dose of amphetamine can cause permanent damage to the blood vessels to the brain (Lukas, 1989, p. 14).

Other effects of amphetamine use include dilated pupils, dry mouth, increased breathing rate, and increased use of the body's stored energy (Lukas, 1989, p. 14). Users may also have headaches, sweating, blurred vision, and dizziness. Most heavy/long term users of amphetamines report a constant irritability, nervousness, difficulty sleeping, and suspiciousness. Other effects from long term use include hallucinations (seeing things that are not there), heart and blood vessel toxicity (poisoning), and severe malnutrition (improper eating). Many also report headaches and trouble concentrating even after they have stopped using these drugs for months. It is not clear whether stimulants have aggravated (worsened) existing psychiatric conditions, or long-term amphetamine use has changed the brain's chemistry. These persons sometimes improve after being given low doses of phenothiazines (downers such as thiorazine). Anti-depressant drugs have helped some people who have severe depression after amphetamine withdrawal (FBP, 1991, p. 6,10/Inaba & Cohen, 1990, p. 72).

Much like cocaine, amphetamines release neurotransmitters that imitate sexual pleasure. Because of this, amphetamines are used by those who are sexually active and have multiple sex partners, and people with prolonged (long lasting) sexual activity tend to use these drugs. The drug has also been used heavily in various gay populations for sexual reasons. But again, because of the rapid development of tolerance, larger and larger doses are needed to produce the same effects resulting in actual decrease of sexual drive (Inaba & Cohen, 1990, p. 72).

Unlike cocaine, amphetamines do not have an anesthetic (pain-relieving) effect. Amphetamines do constrict (shrink) blood vessels, but do not produce a numbness like cocaine. This constriction of vessels will slow the absorption of amphetamine from the nasal tissues, and will also reduce circulation in nasal tissues. Amphetamines tend to make skeletal muscles more tense. Strangely enough, amphetamines dilate or open the bronchial tubes (air passages). This is the reason why asthma sufferers are treated with low doses of amphetamines placed into inhalers (FBP, 1991, p. 10).

Amphetamine overdose is uncommon. Most first-time users can tolerate high doses; although, the likelihood of heart failure, aneurysm (blood vessel break), and instant death do increase because of the increase in heart rate and blood pressure from using this drug. The most important danger connected with the use of amphetamines is the gradual physical deterioration (wasting away) which occurs in long-term users. The addiction and long-term effects of this drug seem to cause weight loss, increased susceptibility (capacity for) to infections, poorer health, and abnormal heart rate (FBP, 1991, p. 10).

STUDY QUESTIONS

1. Describe the difference between amphetamine, dextroamphetamine, & methamphetamine.
2. What is smokable methamphetamine called?
3. Why is "ice" such a dangerous drug?
4. Amphetamines _____ the body's own natural stimulants.

5. Those who cook "ice" risk the possibility of _____ that can hurt those in the lab and those in the immediate area.
6. How small a dose of "ice" begins to have an effect?
7. What do workers think "ice" use does to work performance?
8. The paper lists at least twenty bad side effects of "ice." Name ten of them.
9. What happens to a person's weight when they go on an "ice" binge?
10. What are the three types of paranoid delusions known to occur in "ice" users?
11. _____ problems that usually show up in old people are showing up in young "ice" users.
12. What is kindling?
13. What are the four methods of taking amphetamines?
14. What makes smoking amphetamines so dangerous?
15. Continued use of amphetamines can lead to _____ and _____.
16. What do amphetamines do to the blood vessels & the heart?
17. What do heavy/long-term amphetamine users report?
18. What are the addiction & long-term effects of amphetamines?

LONG-TERM PHYSICAL EFFECTS OF AMPHETAMINES

Some of the long-term medical problems which can be caused by intravenous use (shooting up) of amphetamines include hepatitis, skin infections, tetanus, and possibly AIDS. Seizures (convulsions) sometimes happen to heavy amphetamine users no matter how they took it. Heavy amphetamine users have "shakes," depression, and exhaustion when they "crash" after staying high for several days straight. Long-term users have dental problems, poor nutrition due to no food, can not perform sexually, and sometimes die from an overdose (FBP, 1991, p. 12).

Dying from amphetamine overdose is rare, but it can happen. The sudden increase in blood pressure when amphetamines are used can cause arteries in the brain to break. The most common cause of death due to amphetamine overdose is a heart attack. The heart is speeded up, but the blood vessels which supply it are constricted (made smaller). This could cause a heart attack and death. Smoking amphetamine is the most dangerous way to take the drug. Large amounts of the drug get into the blood stream through the lungs. It is more common for a person to waste away physically, to a life-threatening condition, because he or she does not eat properly when using

amphetamines. If amphetamine use increases, the number of deaths caused by amphetamine use is also expected to increase (FBP, 1991, p. 12).

Long-term heavy amphetamine use can cause malnutrition (not eating properly or at all), and several diseases that are caused by vitamin shortages. Regular use can cause lack of sleep, weight loss, and depression. Many uses of large amounts of amphetamines can cause brain damage that results in disturbed speech and thoughts and sleep difficulties long after use has stopped. Unsterile needles and/or contaminated solutions can cause serious and life-threatening infections in people who shoot amphetamines. Contaminated solutions can cause fatal lung or heart disease as well as diseases of the blood vessels. Strokes, kidney damage, or other damage may also occur. Dirty and/or shared needles could spread hepatitis, tetanus, or AIDS (FBP, 1991, p. 12).

Study Questions

1. What are some of the symptoms heavy amphetamine users experience when they "crash" after several days of use?
2. What is the most common cause of deaths due to amphetamine overdose?
3. Smoking amphetamines is the _____ way to take the drug.
4. Long-term amphetamine use can cause _____ and several diseases that are caused by _____.
5. What diseases can dirty and/or shared needles spread?

EFFECTIVE DOSE TO LETHAL DOSE RATIO

The lethal (deadly) dose of amphetamines probably exceeds 1000 milligrams. The effective dose, as mentioned before, could be 10 to 100 milligrams. Since tolerance does build, taking more of the drug is needed for the desired effect. The lethal dose does climb as tolerance builds, so that a high-tolerance user would probably need more to overdose than a novice (beginner) user. Overdose deaths are not commonly reported; although, deaths due to aggressiveness and criminal activity are probably higher for users than for non-users. Because smoking amphetamine is relatively recent, there is not enough information about overdose deaths from smoking "ice." If amphetamines are the same as cocaine in overdose rate, there will be many thousands of emergency room visits and hundreds of deaths per year in the 1990's (FBP, 1991, p. 10,11).

STUDY QUESTIONS

1. The lethal (deadly) dose of amphetamines probably exceeds _____ milligrams.
2. The effective dose could be _____ to _____ milligrams.

PATTERN OF USE

The typical amphetamine user has tried amphetamines orally (by mouth using pills) and may or may not have liked them. He has used other drugs, perhaps a little, perhaps a lot. His first intravenous use (shooting up) of amphetamines was an ecstatic (overjoyed) experience. The effect differed from taking amphetamines by mouth. He discovered that the intravenous amphetamine's high is much better. Typically, early drug use is intermittent (used occasionally). Gradually, the frequency of use of amphetamines in drug binges increases until the final pattern is reached in which the user (now called a "speed freak") injects the drug many times a day. Each dose rises into the hundreds of milligrams, and he remains awake for three to six days, gradually getting more tense, trembly, and paranoid as the "run" continues (Spotts & Spotts, 1980, p. 206).

The runs are interrupted by periods of deep sleep (called "crashing") which lasts a day or two. Soon after awakening from crashing, the drug is again injected and a new run starts. The periods of continually being awake may be extended to weeks if the user is able to sleep even as little as an hour a day. One of the main reasons why the user injects himself three or four times a day is to get the "flash," - a few seconds after injection, the user experiences a sudden, intense, highly pleasurable sensation; an indescribable and ecstatic reaction called the flash. The intensity and quality of the flash will vary from time to time, depending on how good the amphetamines are. The intense sense of well-being that follows the flash seems, in part, purely internal (inside), and partly due to the feelings of ability and invulnerability (incapable of being hurt) which are produced by the drug. Suddenly, magically, you are on top of the world. It is the desire to reexperience the flash and the euphoria and avoid the fatigue and depression associated with "coming down" which drives users to increase their dose and frequency (how often) of injection (Spotts & Spotts, 1980, p. 206).

We know that amphetamine abuse can result in anorexia (loss of weight due to not eating), malnutrition (improper eating habits) and paranoia, but one interesting effect produced by amphetamine use is its capacity to induce (make) compulsive behavior which is repeated for long periods of time. Houses may be cleaned, automobiles polished, or items arranged to an inhuman degree of perfection (Spotts & Spotts, 1980, p. 206). One meth user said, "If I ran out of stuff to do, I would dump out everything in the vacuum cleaner, and vacuum it back up. I didn't like to be outside too much because I would get paranoid; I felt uneasy outside, preferred to be indoors, cleaning, talking" (Inaba & Cohen, 1990, p. 73).

Unfortunately, this compulsive behavior produced by amphetamine abuse can take on a destructive character, as in skin-picking which can produce ugly ulcerations (sores on the skin) (Spotts & Spotts, 1980, p. 206,207).

STUDY QUESTIONS

- 1. How many days might an amphetamines users stay awake during a "binge," and how many days might the amphetamine user sleep?**
- 2. What types of non-destructive & destructive behavior are described?**

PSYCHOLOGICAL EFFECTS AND DEPENDENCY

Users report that a psychological dependence can develop to amphetamine's use. This dependency is characterized by a feeling that the drug is essential (critical) to normal living. These users often continue to use amphetamines to avoid the depression or "down" mood they get when the drug's effect wear off. In addition, people who use amphetamines regularly may develop

tolerance, the need to take larger doses to get the same initial effect (FBP, 1991, p. 10).
Methamphetamine user: "I think when you're using the drug, it's real easy to deny everything that's going on, and put everything on the shelf and not cope with it. Your whole world becomes the acquiring of whatever drug you happen too be using. Get the money, then get the drug. But when you stop, its all there to meet you, and you have to deal with it eventually" (Inaba & Cohen, 1990, p. 73).

Users also report increased irritability, nervousness, intense craving, and aggressiveness as typical changes in their personalities caused by stimulant dependence. The higher potency (strength) stimulants can produce more serious psychological conditions, including intense depression following withdrawal of these drugs, and severe (serious) paranoia (feeling of persecution) or delusional psychosis (sickness of the mind). People who use large amounts of amphetamines over a long period of time also can develop amphetamine psychosis. Amphetamine psychosis typically looks like schizophrenia (a very serious mental disorder), especially the paranoid type (Spotts & Spotts, 1980, p. 165).

Some of the effects of this psychosis are seeing, hearing, and feeling things that do not exist (hallucinations), and feeling as though people are out to get them (paranoia: delusions of persecution). There are reports of chronic (habitual) users hiding in closets, under beds, or in dark rooms while pointing guns at imagined enemies. During the chronic paranoid state, the user believes law enforcement agents are closing in, and that a potential crisis (emergency) is just about to happen (FBP, 1991, p. 12,13).

People in this extremely suspicious state often show bizarre (strange) and sometimes violent behavior (FBP, 1991, p. 13). In fact, murders and other violent offense have been connected to amphetamine intoxication. For example, Angis and Smith describe a case of a male who murdered two people and shot several other people. This person had been using amphetamines in increasing doses for three weeks. The individual had developed paranoid delusions (mental sickness) and killed two people in a blind rage. Several studies of prison inmates have shown that a large percentage of inmates have committed their crimes while under the influence of amphetamines (King & Ellinwood, 249).

Since cocaine intoxication (high) does not last as long as amphetamine intoxication, most paranoid delusions go away as the cocaine user regains a better grasp of reality. The amphetamine user could potentially stay in a longer psychotic state because of the length of the high from this drug. Therefore, aggressive and paranoid acts could happen more often in comparison to the crack user. These symptoms usually disappear when people stop using the drug. However, there are cases where the psychosis does not clear up quickly and being put in a psychiatric hospital is needed (FBP, 1991, p. 13).

STUDY QUESTIONS

1. Users also report increased _____, _____, _____, and _____ as typical changes in their personalities.
2. What can large amounts of amphetamines cause over a long period of time?
3. What are some of the effects of the results of question #3?
4. People in this extremely suspicious state often show _____ & sometimes _____ behavior.

5. Will the amphetamine user have a longer or shorter period of time in a psychotic state than a cocaine user? YES or NO.

WITHDRAWAL

Withdrawal occurs when a compulsive user on amphetamines or stimulants stops using the drug. The intensity (strength) of the withdrawal depends on how the user was taking the drug (snorting, shooting, smoking), how often it was taken, and how strong the dosage was. Most stimulant withdrawal follows a normal course which differs according to the strength of the stimulant used. The withdrawal symptoms usually include exhaustion (being completely tired), depression, irritability, sleeplessness, loss of energy, and sometimes the craving to take more amphetamines. The usual pattern is for the amphetamine user to sleep for several days during the withdrawal period. Since depression occurs during the early stages of withdrawal, suicide may be more likely during this time, especially if the person has personality, legal, or financial problems (FBP, 1991, p. 11).

Amphetamines do not produce a physical dependence (addiction) like heroin in the sense that the body's organs go into convulsions or have some other physical problem during withdrawal. Amphetamines do produce withdrawal symptoms which are at least in part physical (exhaustion and depression caused by the absence of neurotransmitters), especially among those who inject (shoot) or smoke methamphetamine, but the physical symptoms are basically exhaustion. Although there is little physical dependence, there can be a strong psychological dependence. People can get in a state of mind in which they believe that they need stimulants in order to function, and they can develop a craving (necessity) for the drug. This craving for the "high" can lead to severe neglect (not paying attention) of their health, including malnutrition (eating unhealthy foods only or not eating) because these drugs take away hunger and thirst (FBP, 1991, p. 11).

The most common bad effect associated with drug withdrawal and drug dependency on the family is financial (money) and emotional. The user who becomes dependent on this drug allows it to be the focus of his or her life, even more important than family and friends. Amphetamine addicts will lie, take money from their family, ignore responsibilities, and prefer to be high rather than spend time with loved ones. Amphetamines become their primary (most important) love in life and their major source of pleasure. There are many who have lost houses, cars, jobs, and freedom due to their unreasonable desire for these drugs (FBP, 1991, p. 11).

Since withdrawal from prolonged amphetamine use is almost all a mental process, the majority of patients who want to stop using can be treated by abstinence (complete stopping of use) and by intensive counseling. Users should stay away from all stimulants which also includes caffeine and tobacco. When symptoms are severe and don't respond to counseling, a variety of medical treatments can be used. These include antidepressant agents, such as tofranil, nortriptyline, elavil, sinequan or desryl. They help fix serotonin, the neurotransmitter in the brain that deals with both depression and insomnia (inability to sleep). There are other drugs that are used, such as haldol and thorazine, that help to control paranoia and pleasure sensations (hunger, thirst, sex). An amphetamine user will give themselves depressants (downers) to control the amphetamine stimulation. This has led to a major poly-drug problem called "speedballing." Speedballing is mixing two drugs together for the purposes of taking the edge off of each individually (Inaba & Cohen, 1990, p. 73).

When people stop using amphetamines abruptly, they may experience fatigue, long periods of sleep, irritability, hunger, and depression. The length and severity of the depression seems to be related to how much and how often the amphetamines were used. All stimulants put the body in a condition called "stress" which is necessary in emergency situations, but does wear out the body's

resources. Because of this, the need to sleep following withdrawal from amphetamines is a rebound effect where the body attempts to replenish (put back) depleted (used up) chemical resources (FBP, 1991, p. 13).

STUDY QUESTIONS

- 1. What are the things which will determine the intensity of the withdrawal from amphetamines?**
- 2. What symptoms are common with stimulant withdrawals?**
- 3. Are withdrawal symptoms primarily due to physical dependence or psychological dependence?**
- 4. What will amphetamine addicts do to be high?**
- 5. There are many who have lost _____, _____, _____, and _____ due to their unreasonable desire for drugs.**
- 6. What should users attempting to withdrawal stay away from?**
- 7. What is "speedballing?"**

LOOK-ALIKE STIMULANTS

Look-alike stimulants are drugs made to look like real amphetamines and imitate their effects. The drugs usually contain different amounts of caffeine, ephedrine, and phenylpropandamine. These three legal substances are weak stimu and often are found in over-the-counter drug preparations such as diet pills and decongestants. More recently, new drugs called "act-alikes" have been made to avoid state laws that prohibit look-alikes. The act-alikes have the same ingredients as the look-alikes but do not physically look like any prescription or over-the-counter drugs. These drugs are sold on the street as "speed" and "uppers," and are expensive, even though they are not as strong as amphetamines. They often are sold to young people who are told they are legal, safe, and harmless. This is one reason they are being increasingly abused (FBP, 1991, p. 13).

STUDY QUESTIONS

- 1. What are look-alike stimulants, and what do they usually contain?**
- 2. How do act-alike drugs differ from look-alike drugs?**
- 3. What are young people being told about act-alike drugs?**

EFFECTS OF LOOK-ALIKE STIMULANTS

Some negative effects of look-alikes, especially when taken in large quantities, are similar to the effects of amphetamines. These effects include anxiety, restlessness, weakness, throbbing

headache, difficulty breathing, and a rapid heartbeat. There have been several reports of very high blood pressure leading to cerebral hemorrhaging (bleeding in the brain) and death. Often, in an emergency, look-alike drug overdose cases are mistaken by doctors and poison control centers. This can cause a problem in determining the proper treatment (FBP, 1991, p. 14).

One of the greatest dangers is that these drugs are easily available, and are being used by young people and others who do not normally abuse drugs. Once people start using these drugs, they may be at high risk for other drugs. Because look-alikes are not as strong as real amphetamines, they are extremely dangerous for people who deliberately, or accidentally take the same amount of real amphetamines as they would take of the look-alikes. For example, people who buy look-alikes on the "street" may, without knowing it, buy real amphetamines and take enough to cause an overdose. On the other hand, people who have abused amphetamines may think the strength of the look-alike is less than it really is, and take too much which could result in a toxic (poisonous) reaction (FBP, 1991, p. 14).

Although caffeine is present in several "look-alike" drugs and is legal, caffeine is a drug. Overdoses are not common, but can take the form of nervousness and inability to sleep when taken in liquid form. more severe overdoses can easily occur when the caffeine is taken in pill form (e.g., NoDoz, Vivarin). An overdose can result in confusion, convulsions, and paranoia. Like all drugs, caffeine can be used and it can be abused (FBP, 1991, p. 14).

STUDY QUESTIONS

1. **What are some of the negative effects of look-alike drugs?**
2. **What have been some of the reported results?**
3. **What is the greatest danger of look-alike drugs?**
4. **What can happen if a person takes amphetamines instead of a look-alike?**
5. **What are the symptoms of a caffeine overdose?**

LEGAL ISSUES

In 1970, public law 91-513, known as the Controlled Substances Act (CSA), was enacted (made into law). This law gives the Federal Drug Enforcement Administration (DEA) the power to watch over anybody who legally makes amphetamines, as well as find and arrest anybody who is illegally making, selling, as well as trafficking amphetamines (Lukas, 1989, p. 17).

The CSA divides drugs into five different lists, or schedules, in order of decreasing potential for abuse. Schedule I drugs are the most illegal and detrimental (bad); they have no medical use and include drugs such as heroin, marijuana, and hallucinogens (LSD, Peyote, etc.). On the other end of the scale, schedule V drugs are generally over-the-counter drugs or easily bought without a prescription. Amphetamines and amphetamine related-compounds are Schedule II drugs. Being found in possession of a Schedule II drug, selling it, trafficking it, or using it illegally can result in heavy fines and imprisonment (Lukas, 1989, p. 18).

STUDY QUESTION

1. What is the legal status of amphetamines and amphetamine-related substances?

REFERENCES

Inaba, Darryl, Pharm. D & Cohen, William. (1990) Uppers, Downers, and All Arounders. Ashland: Cinemed Inc.

Spotts,PH.D. & Spotts,M.A.; (1980). "Use and Abuse of Amphetamine and Its Substitutes". National Institute on Drug Abuse, Issue 25.

King, PH.D. & Ellinwood. Jr., M.D.; Amphetamines and Other Stimulants, Article.

Nuckols; "Hazeldon Educational Materials - The Allure of Ice," Aug. 1990; Hazeldon Educational Materials.

Lukas, Scott Ph.d. (1988). Amphetamines, The Encyclopedia of Psychoactive Drugs. City:Chelsea House Ed. Talking Books.

Federal Bureau of Prisons: Drug Education Lecture Series, Chapter 8: Amphetamines & Other Stimulants, (1991).