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## Methamphetamine Abuse and Addiction

The abuse of methamphetamine - a potent psychostimulant - is an extremely serious and growing problem. Although use of methamphetamine initially was limited to a few urban areas in the Southwest, several major Western cities and Hawaii have seen dramatic increases in its use, and rural areas throughout the country are becoming more affected by the drug. "Meth abuse is changing the American landscape unlike any other illegal drug before it", says Carol Falkowski, Director of Research Communications at Hazelden Treatment Center in Minnesota.

Meth use and manufacture in South Dakota has become a significant problem. A report from the Drug Enforcement Administration's website says this about South Dakota's current situation: "The use of methamphetamine continues to affect the rural areas as well as the urban areas throughout the state of South Dakota. Methamphetamine has come to the attention of the public from an increasingly aware media, informed public officials from the local to the national level, and concerned citizens...." In South Dakota, there were 17 labs incidents, 724 people were arrested, and 21.41 pounds of methamphetamine were seized in 2005.

Methamphetamine abuse affects not only individuals and families, but also school systems, medical services, communities, foster care, and the state's provision of social services as a whole. This CEU course is designed to educate social workers about the symptoms, uses, short and long term effects, and treatment of this highly addictive drug.

### What is methamphetamine

Methamphetamine is a powerfully addictive stimulant that dramatically affects the central nervous system. The drug is made easily in clandestine laboratories with relatively inexpensive over-the-counter ingredients. These factors combine to make methamphetamine a drug with high potential for widespread abuse.

Methamphetamine is commonly known as "speed," "meth," and "chalk." In its smoked form, it is often referred to as "ice," "crystal," "crank," and "glass." It is a white, odorless, bitter-tasting crystalline powder that easily dissolves in water or alcohol. Methamphetamine's chemical structure is similar to that of amphetamine, but it has more pronounced effects on the central nervous system. Like amphetamine, it causes increased activity, decreased appetite, and a general sense of well-being. The effects of methamphetamine can last 6 to 8 hours. After the initial "rush", there is typically a state of high agitation that in some individuals can lead to violent behavior.

Methamphetamine is a Schedule II stimulant, which means it has a high potential for abuse and is available only through a prescription that cannot be refilled. There are a few accepted medical reasons for its use, such as the treatment of narcolepsy, attention deficit disorder, and - for short-term use - obesity; but these medical uses are limited.

### When did methamphetamine abuse start?

According to the U.S. Drug Enforcement Administration, meth has been the most prevalent clandestinely produced controlled substance in the United States since 1979.

First synthesized in Germany in 1887, amphetamine was for a long time, a drug in search of a disease. Nothing was done with the drug, from its discovery until the late 1920's when it was seriously investigated as a cure or treatment for conditions from depression to decongestion.

Amphetamine was first marketed in the 1930s under the name Benzedrine in an over-the-counter inhaler to treat nasal congestion and allergies. By 1937, amphetamine was available by prescription in tablet form and was used in the

treatment of the sleeping disorder narcolepsy and something called minimal brain dysfunction (MBD), which today is called attention deficit hyperactivity disorder (ADHD). During World War II, amphetamine was widely used to keep soldiers going. During this period, both dextroamphetamine (Dexedrine) and methamphetamine (Methedrine) became easily available.

As use of amphetamines spread, so did the tendency to become addicted. Amphetamines became a cure-all for helping truckers to complete their long routes without falling asleep, college students to study for tests, for weight control, for helping athletes to perform better and train longer, and for treating mild depression. Intravenous amphetamine abuse spread among a subculture known as "speed freaks." As time went on, it became evident that the dangers of abuse of these drugs outweighed most of their therapeutic uses.

In 1965, greater attempts to control amphetamines were instituted with amendments to the federal food and drug laws to curb the black market in amphetamines. Many pharmaceutical amphetamine products were removed from the market and doctors prescribed those that remained with reluctance. In order to meet the ever increasing black market demand for amphetamines, illegal laboratory production mushroomed, especially methamphetamine laboratories on the West Coast. Today, most amphetamines distributed to the black market are produced in clandestine laboratories.

### **What is the scope of methamphetamine abuse in the United States?**

According to the 2002 National Institute on Drug Use and Health, 12.4 million Americans age 12 and older (5.3 percent of the population) had tried meth at least once, with the majority of the past year's users being between 18 and 34 years of age.

Drug abuse emergency room (ER) visits involving amphetamine and meth increased 54 percent from 1995 to 2002, according to the Drug Abuse Warning Network (DAWN) of the Substance Abuse and Mental Health Services Administration (SAMSHA), with significant increases cited for cities from the Northeast, Midwest and South. Once largely confined to the western region of the United States, meth abuse is now widespread in big cities and small towns across the country. In 1994, methamphetamine abuse accounted for 33,433 of drug treatment admissions. By 2004, that number had increased to 129,079. Methamphetamine availability and production are being reported in more diverse areas of the country, particularly rural areas, prompting concern about more widespread use.

Methamphetamine abuse is playing havoc with the criminal justice system as well. In 2003, 4.7% of male arrestees and 8.8% of female arrestees tested positive for meth at the time of their arrest. Medical costs for meth-addicted inmates are causing deficits in allotments for health care in prison budgets.

### **Where does methamphetamine come from?**

Traditionally, the suppliers of methamphetamine throughout the United States have been outlaw motorcycle gangs and numerous other independent trafficking groups. Although these groups continue to produce and distribute methamphetamine, organized crime drug groups operating from Mexico currently dominate wholesale methamphetamine trafficking in the United States for several reasons: these organizations established access to wholesale ephedrine sources of supply on the international market; these organizations are producing unprecedented quantities of high-purity methamphetamine on a regular basis; and, they already control well-established cocaine, heroin, and marijuana distribution networks throughout the western United States, enabling them to supply methamphetamine to a large retail level market. Their expansion into the methamphetamine trade has added a new dimension to their role in the U.S. drug market and has redefined the methamphetamine problem in the United States. Presently, these organizations are poised to supply methamphetamine to the rest of the country in response to any increases in demand. Interstate 90, which runs east to west through South Dakota, is increasingly being used for the transportation of drugs and currency by trafficking organizations.

Small toxic labs in rural areas have may be decreasing at present, in part due to laws restricting their access to products containing ephedrine. Local lab operators are obtaining chemicals at local hardware stores, truck stops, and department stores. Production capabilities of these small labs are usually less than one ounce. The stealing of anhydrous ammonia fertilizer from farm supply stores and farmers has also emerged as a serious problem in this agricultural state. Typical locations for these labs are abandoned farmhouses, hunting lodges, and even government lands.

## **Who uses meth?**

"Most people would be surprised at who uses meth: professionals, housewives, kids in school--people looking for a lift in life," said Mark Sheets, executive director of Adult Continuum Services for Hazelden in Center City, Minn. "It's hard to detect when you first see it. Look for sudden bursts of energy followed by sleeping a lot. Paranoia, hyperactivity and excessive weight loss are other signs."

The drug originally gained popularity on the West Coast, traditionally by white, male, blue-collar workers, according to NIDA Research Report Series: *Methamphetamine Abuse and Addiction*. However, methamphetamine use has since spread to other parts of the country and is being used by diverse populations which include women, youth involved in the rave culture, and people living in rural communities.

Women make up 47 percent of all treatment admissions for methamphetamines, which is a much greater percentage than admissions associated with most other drugs, according to the Treatment Episode Data Set, 1992-2000. But why is the drug so appealing to females?

Women begin taking methamphetamine for a variety of reasons. Some are attracted to the drug because it suppresses their appetite and makes it easier for them to lose weight. Other women use methamphetamine to increase their energy level so that they can take care of their children or work long hours without becoming fatigued.

Methamphetamine is relatively easy to make using household products, but the chemicals can cause dangerous explosions when they interact with one another. Some women endanger the lives of their children by making the drug themselves while their children are nearby. In fact, the U.S. Drug Enforcement Administration (DEA) reports that children are present in more than 20 percent of seized meth labs. These children often wind up in foster care while their parents go to prison.

## **Youth**

Besides the children who are exposed to the drug through their parents, young people often are introduced to methamphetamine at raves (all-night parties). For this reason the drug is normally classified as a "club drug." Methamphetamine is appealing to youth because it increases their energy level so that they can dance without tiring to the fast-paced music that is typical of raves.

While most young people do not ever experiment with methamphetamine, results from the study *Monitoring the Future, 1975-2001*, show that more than 4 percent of 8th graders, more than 6 percent of 10th graders, and a little less than 7 percent of 12th graders have tried methamphetamine at least once in their lifetime. Methamphetamine use has fluctuated within these age groups over the past 3 years (the length of time that *Monitoring the Future* has tracked youth methamphetamine use) and this year marks an increase among eighth graders.

## **Rural Communities**

Methamphetamine use among youth and adults is especially troublesome in rural parts of the country. The DEA says that "methamphetamine has become the most dangerous drug problem of small-town America." In fact, the DEA's *Fast Facts About Meth* notes that youth ages 12 to 14 who live in small towns are 104 percent more likely to use the drug than young people living in larger cities.

While other drugs—such as cocaine or heroin—are usually distributed by dealers at varying costs, methamphetamine is attractive to people in rural communities because labs can be set up in abandoned barns, plus the drug is inexpensive. Formulas for making methamphetamine are easily obtainable over the Internet.

## **What does meth look like?**

The finished product is available in different forms, including powder, pills – either tablets or capsules of various colors; or in crystal form – hard, irregular chunks that look like ice or rock candy. Meth often looks like white crystalline powder. It is soluble in water or alcohol and is bitter-tasting. Meth is frequently packaged in plastic baggies, aluminum foil packets, and many other common household containers. All of these factors combine to make it difficult to detect meth.

Some of the paraphernalia associated with meth use includes light bulbs (hollowed out and used to heat either powder or crystal meth), the resulting fumes are inhaled; pens (empty barrels are used to transport meth, or as a stem to inhale cooked meth fumes); aluminum foil and bottle caps (also used to heat meth); empty pop cans (made into meth pipes); and needles for injecting liquefied meth.

### **What are common ingredients for making meth?**

One reason behind the explosive growth in meth labs is the availability of the components. These are just a few of the common ingredients used in making methamphetamines:

#### **Common Ingredients for Making Meth**

Alcohol (gasoline additives or rubbing alcohol)		Benzene
Paint thinner	Freon	Acetone
Chloroform	Camp stove fuel	Anhydrous ammonia
White gasoline	Phenyl-2 Propane	Phelyacetone
Rock, table or Epsom salt	iodine crystals	Red Phosphorus
Toluene (in brake cleaner)	Red Devil Lye	Drain cleaner
Muriatic Acid	Battery acid	Lithium from batteries
Sodium metal	Ephedrine	Cold tablets
Diet aids	Iodine	Bronchodialotors

Methamphetamine can be easily manufactured in clandestine laboratories (meth labs) using ingredients purchased in local stores. Over-the-counter cold medicines containing ephedrine or pseudoephedrine are other materials are "cooked" in meth labs to make methamphetamine.

Meth labs can be portable and so are easily dismantled, stored, or moved. The portability helps methamphetamine manufacturers avoid law enforcement agencies. Meth labs have been found in many different types of locations, including apartments, hotel rooms, rented storage spaces, trucks, and even car trunks. These labs have been known to be boobytrapped and lab operators are often armed.

Possession of lab equipment such as tubing, unmarked Mason jars with tubes attached, stained coffee filters, 2-liter pop bottles, blenders, camera batteries, wooden matches, propane cylinders and hot plates are tip offs to the production of meth.

Individually, each product is legal and useful. But when mixed together and processed, the results are deadly - to the producer, user and innocent bystanders.

### **How is methamphetamine used?**

Methamphetamine comes in many forms and can be smoked, snorted, orally ingested, or injected. The drug alters moods in different ways, depending on how it is taken.

Immediately after smoking the drug or injecting it intravenously, the user experiences an intense rush or "flash" that lasts only a few minutes and is described as extremely pleasurable. Snorting or oral ingestion produces euphoria - a high but not an intense rush. Snorting produces effects within 3 to 5 minutes, and oral ingestion produces effects within 15 to 20 minutes.

As with similar stimulants, methamphetamine most often is used in a "binge and crash" pattern. Because tolerance for methamphetamine occurs within minutes - meaning that the pleasurable effects disappear even before the drug concentration in the blood falls significantly - users try to maintain the high by binging on the drug. In the 1980's, "ice," a smokable form of methamphetamine, came into use. Ice is a large, usually clear crystal of high purity that is smoked in a glass pipe like crack cocaine. The smoke is odorless, leaves a residue that can be resmoked, and produces effects that may continue for 12 hours or more.

### **What are the immediate (short-term) effects of methamphetamine abuse?**

As a powerful stimulant, methamphetamine, even in small doses, can increase wakefulness and physical activity and decrease appetite. A brief, intense sensation, or rush, is reported by those who smoke or inject methamphetamines. Oral ingestion or snorting produces a long lasting high instead of a rush, which reportedly can continue for as long as half a day. Both the rush and the high are believed to result from the release of very high levels of the neurotransmitter dopamine into areas of the brain that regulate feelings.

Methamphetamine has toxic effects. In animals, a single high dose of the drug has been shown to damage nerve terminals in the dopamine-containing regions of the brain. The large release of dopamine produced by methamphetamine is thought to contribute to the drug's toxic effects on nerve terminals in the brain. High doses can elevate body temperature to dangerous, sometimes lethal, levels, as well as cause convulsions.

### **Symptoms of Methamphetamine Use**

- Inability to sleep
- Increased sensitivity to noise
- Nervous physical activity, such as scratching
- Irritability, dizziness, or confusion
- Extreme anorexia
- Tremors or convulsions
- Increased heart rate and blood pressure
- Presence of inhaling or injecting paraphernalia.

### **What are the long-term effects of methamphetamine abuse?**

Long-term methamphetamine abuse results in many damaging effects, including addiction. Addiction is a chronic, relapsing disease, characterized by compulsive drug-seeking and drug use which is accompanied by functional and molecular changes in the brain. In addition to being addicted to methamphetamine, chronic methamphetamine abusers exhibit symptoms that can include violent behavior, anxiety, confusion, and insomnia. They also can display a number of psychotic features, including paranoia, auditory hallucinations, mood disturbances, and delusions (for example, the sensation of insects creeping on the skin, which is called "formication"). The paranoia can result in homicidal as well as suicidal thoughts.

With chronic use, tolerance for methamphetamine can develop. In an effort to intensify the desired effects, users may take higher doses of the drug, take it more frequently, or change their method of drug intake. In some cases, abusers forego food and sleep while indulging in a form of bingeing known as a "run," injecting as much as a gram of the drug every 2 to 3 hours over several days until the user runs out of the drug or is too disorganized to continue. Chronic abuse can lead to psychotic behavior, characterized by intense paranoia, visual and auditory hallucinations, and out-of-control rages that can be coupled with extremely violent behavior.

Although there are no physical manifestations of a withdrawal syndrome when methamphetamine use is stopped, there are several symptoms that occur when a chronic user stops taking the drug. These include depression, anxiety, fatigue, paranoia, aggression, and an intense craving for the drug.

In scientific studies examining the consequences of long-term methamphetamine exposure in animals, concern has arisen over its toxic effects on the brain. Researchers have reported that as much as 50 percent of the dopamine-producing cells in the brain can be damaged after prolonged exposure to relatively low levels of methamphetamine. Researchers also have found that serotonin-containing nerve cells may be damaged even more extensively. Whether this toxicity is related to the psychosis seen in some long-term methamphetamine abusers is still an open question.

### **Long term effects:**

- Dependence
- Addiction psychosis
- Paranoia
- Hallucinations
- Mood disturbances
- Repetitive motor activity
- Stroke

- Weight loss

### **How is methamphetamine different from other stimulants, such as cocaine?**

Methamphetamine is classified as a psychostimulant, as are other drugs of abuse such as amphetamine and cocaine. Methamphetamine is structurally similar to amphetamine and the neurotransmitter dopamine, but it is quite different from cocaine. Although these stimulants have similar behavioral and physiological effects, there are some major differences in the basic mechanisms of how they work at the level of the nerve cell. However, the bottom line is that methamphetamine, like cocaine, results in an accumulation of the neurotransmitter dopamine, and this excessive dopamine concentration appears to produce the stimulation and feelings of euphoria experienced by the user. In contrast to cocaine, which is quickly removed and almost completely metabolized in the body, methamphetamine has a much longer duration of action and a larger percentage of the drug remains unchanged in the body. This results in methamphetamine being present in the brain longer, which ultimately leads to prolonged stimulant effects.

### **Characteristics of Methamphetamine vs Cocaine**

<b>Methamphetamine</b>	<b>Cocaine</b>
Man-made	Plant derived
Smoking produces a high that lasts 8-24 hours	Smoking produces a high that lasts 20-30 minutes
50% of the drug is removed from the body in 12 hours	50% of the drug is removed from the body in 1 hour

### **What are the medical complications of methamphetamine use?**

Methamphetamine can cause a variety of cardiovascular problems. These include rapid heart rate, irregular heartbeat, increased blood pressure, and irreversible, stroke-producing damage to small blood vessels in the brain. Hyperthermia (elevated body temperature) and convulsions occur with methamphetamine overdoses, and if not treated immediately, can result in death.

Chronic methamphetamine abuse can result in inflammation of the heart lining, and among users who inject the drug, damaged blood vessels and skin abscesses. Methamphetamine abusers also can have episodes of violent behavior, paranoia, anxiety, confusion, and insomnia. Heavy users also show progressive social and occupational deterioration. Psychotic symptoms can sometimes persist for months or years after use has ceased.

Acute lead poisoning is another potential risk for methamphetamine abusers. A common method of illegal methamphetamine production uses lead acetate as a reagent. Production errors may therefore result in methamphetamine contaminated with lead. There have been documented cases of acute lead poisoning in intravenous methamphetamine abusers

Fetal exposure to methamphetamine also is a significant problem in the United States. At present, research indicates that methamphetamine abuse during pregnancy may result in prenatal complications, increased rates of premature delivery, and altered neonatal behavioral patterns, such as abnormal reflexes and extreme irritability. Methamphetamine abuse during pregnancy may be linked also to congenital deformities.

### **"Meth Mouth"**

One of the many problems this drug produces is rampant tooth decay with the teeth literally falling apart. Methamphetamine use reduces the amount of saliva produced in the mouth. Saliva is important for neutralizing acids and clearing food from the teeth. Decreased saliva flow allows the build up of bacteria to ten times over normal levels. Without saliva, acids can eat away tooth enamel which in turn causes cavities. Many methamphetamine users also drink high-sugar containing beverages to alleviate dry mouth. In addition to poor oral hygiene and neglect, the drug "high" that users get produces significant nervousness and anxiety. This agitation often is responsible for "bruxism" (tooth clenching and grinding) damage.

The drug also causes constriction of the blood vessels to the gums and soft tissues. When a person smokes meth, the corrosive ingredients are heated, and vaporized in the user's mouth. They irritate and burn the soft tissues of the mouth. The result is gum disease, mouth sores, infection, and damage to tooth enamel. Snorting draws the caustic substances down the nasal passages and onto the teeth.

Also, a potential danger exists for drug interactions with dental anesthetics. These, in turn, could cause major episodes of high blood pressure or other health problems.

The resultant oral problems have become known as "meth mouth". It is especially prevalent among prison inmates. Because it is difficult to tell the difference between very poor oral hygiene and that caused by drugs, there are no good statistics on the magnitude of the problem. Many states have seen a dramatic rise in the cost for inmate dental care.

### **Are methamphetamine abusers at risk for contracting HIV/AIDS and hepatitis B and C?**

Increased HIV and hepatitis B and C transmission are likely consequences of increased methamphetamine abuse, particularly in individuals who inject the drug and share injection equipment. Infection with HIV and other infectious diseases is spread among injection drug users primarily through the re-use of contaminated syringes, needles, or other paraphernalia by more than one person. In nearly one-third of Americans infected with HIV, injection drug use is a risk factor, making drug abuse the fastest growing vector for the spread of HIV in the nation.

Research also indicates that methamphetamine and related psychomotor stimulants can increase the libido in users, in contrast to opiates which actually decrease the libido. However, long-term methamphetamine use may be associated with decreased sexual functioning, at least in men. Additionally, methamphetamine seems to be associated with rougher sex, which may lead to bleeding and abrasions. The combination of injection and sexual risks may result in HIV becoming a greater problem among methamphetamine abusers than among opiate and other drug abusers, something that already seems to be occurring in California.

NIDA-funded research has found that, through drug abuse treatment, prevention, and community-based outreach programs, drug abusers can change their HIV risk behaviors. Drug use can be eliminated and drug-related risk behaviors, such as needle-sharing and unsafe sexual practices, can be reduced significantly thus decreasing the risk of exposure. Therefore, drug abuse treatment is also highly effective in preventing the spread of HIV,

### **Crystal Meth**

Crystal meth is the most potent form of speed available. It is also known as "crystal", "crank", "tweak", "go-fast", and dozens of other street names. In medicine, it comes in tablet form, as the prescription drug, Desoxyn®. More often, though, it's cooked in makeshift labs and sold on the street as a powder, which is injected, snorted, or swallowed.

A smokable form of crystal, called "ice," or "glass" is also used, so called because it resembles rock candy or a chip of ice. Smoking "ice" brings the user feelings of exhilaration and a sharpening of focus. Smoking ice results in an instantaneous dose of almost pure drug to the brain, giving a huge rush followed by a feeling of euphoria for anything from 2-16 hours. For some, using crystal meth results in obsessive cleaning or tidying, increased sociability, while others experience a sense of sexual liberation.

### **How does Ice compare to crack?**

Ice is a potent, smokable form of methamphetamine, while crack is a potent form of freebase cocaine. The substances are smoked in a similar fashion and both provide the user with an immediate, intense high and increased alertness. Users refer to the sensation from smoking ice as "amping", as in an "over-amped wire", because of the amplified euphoria it gives them. Unlike the 15-minute high produced from using crack, the high from smoking ice can last from 8 to 24 hours.

### **How is ice used?**

Ice is used by placing the substance in a glass pipe, heating it, and inhaling the resulting vapors. The vapors enter the bloodstream directly through the lungs and are rapidly transported to the brain. When ice is heated, its solid crystals turn to liquid. When it cools, ice reverts to its solid state and is therefore reusable. Since ice is odorless, it can easily be used in public without being detected. In addition to its use for recreational purposes, ice is often used in the workplace to increase alertness. Some users smoke ice for days at a time and then "crash" in a deep sleep lasting 24 hours or more.

Crystal meth increases arousal in the central nervous system by pumping up levels of two neurotransmitters, norepinephrine and dopamine. At low doses, it boosts alertness and blocks hunger and fatigue. At higher doses, it causes exhilaration and euphoria. At very high doses, the drug can cause agitation, paranoia, and bizarre behavior. Physical effects include increased heart rate, blood pressure, and increased body temperature.

Widely available in the 1960's, crystal meth faded in the '70s, as controls were tightened on legal production, which reduced its diversion onto the black market. But in the early '90s, crystal meth made an amazing comeback and its use has become widespread since then.

Risks of using crystal meth are so extreme because the drug works so well at “over-amping” the central nervous system and “zapping” feelings of hunger and fatigue. Crystal meth users extend speed "runs" for days or weeks, without food or rest, putting impossible demands on their bodies and brains. For needle users, there are the added hazards that come with injecting any drug. And for ice smokers, there is the largely unknown risk factor of exposing lung tissue to vaporized meth crystals. Crystal meth, more than any other drug pushes the mind and body faster and further than either was meant to go.

The long-term physical toll of crystal meth can be massive, including any or all of the following:

- Vitamin and mineral deficiencies
- Lowered resistance to disease
- Organ damage (particularly to the lungs, liver, and kidneys) after long-term use
- Anxiety
- Depression
- Chronic fatigue
- Delusions
- Toxic psychosis after prolonged, heavy use
- Addiction
- Emotional swings

Symptoms increase with long-term use of crystal meth, and can involve paranoid delusions and hallucinations. Violence and self-destructive behavior are common. Overdose is also a risk with crystal. Symptoms include fever, convulsions, and coma. Death can result from burst blood vessels in the brain (triggered by spikes in blood pressure) or heart failure.

### **Patterns of Abuse**

Methamphetamine abuse has three patterns: low intensity, binge and high intensity. Low intensity abuse describes a user who is not addicted to the drug but uses methamphetamine on a casual basis by swallowing or snorting it. Binge and high intensity abusers are addicted and prefer to smoke or inject meth to achieve a faster and stronger high. Binge abusers use meth more than low intensity abusers, but less than high intensity abusers.

### **Low Intensity Methamphetamine Abuse**

Low intensity abusers swallow or snort meth, using it the same way many people use caffeine or nicotine. Low intensity abusers want the extra stimulation that meth provides so that they can stay awake long enough to finish a task or job, or they want the appetite suppressant effect to lose weight. These people frequently hold jobs, raise families, and otherwise function normally. They may be truck drivers trying to reach their destinations on time, workers trying to stay awake until the end of their normal or an overtime shift, or a homemaker trying to keep a clean house as well as be a perfect mother and wife.

Although law enforcement is not likely to encounter low intensity abusers, these individuals are one step away from becoming binge abusers. They already know the stimulating effect that meth provides them by swallowing or snorting the drug, but they have not experienced the euphoric rush associated with smoking or injecting it and have not entered the clearly defined stages of abuse. However, simple switching to smoking or injecting meth offers these users a quick transition to a binge pattern of abuse.

### **Binge Methamphetamine Abuse**

Binge abusers smoke or inject methamphetamine and experience euphoric rushes that are psychologically addictive.

Binge use includes several stages which are distinct.

**Rush** - The rush is the initial response the abuser feels when smoking or injecting methamphetamine and is the aspect of the drug that low-intensity abusers do not experience when snorting or swallowing the drug. During the rush, the abuser's

heartbeat races and metabolism, blood pressure, and pulse soar. Meanwhile, the abuser can experience feelings equivalent to ten orgasms. Unlike the rush associated with crack cocaine, which lasts for approximately 2 - 5 minutes, the methamphetamine rush can continue for 5-30 minutes.

The reason for the methamphetamine rush is that the drug, when smoked or injected, triggers the adrenal gland to release a hormone called epinephrine (adrenaline), which puts the body in a battle mode, fight or flight. In addition, the physical sensation that the rush gives the abuser most likely results from the explosive release of dopamine in the pleasure center of the brain.

**High** - The rush is followed by the high, sometimes called the “shoulder”. During the high, the abuser often feels aggressively smarter and becomes argumentative, often interrupting other people and finishing their sentences. The high can last 4-16 hours.

**Binge** - The binge is the continuation of the high. The abuser maintains the high by smoking or injecting more methamphetamine. Each time the abuser smokes or injects more of the drug, a smaller euphoric rush than the initial rush is experienced until, finally, there is no rush and no high. During the binge, the abuser becomes hyperactive both mentally and physically. The binge can last 3-15 days.

**Tweaking** - Tweaking occurs at the end of the binge when nothing the abuser does will take away the feeling of emptiness and dysphoria, including taking more methamphetamine. Tweaking is very uncomfortable, and the abuser often takes a depressant to ease the bad feelings. The most popular depressant is alcohol, with heroin a close second.

Tweaking is the most dangerous stage of the methamphetamine abuse cycle to law enforcement officers and other individuals near the abuser. If the abuser is using alcohol to ease the discomfort, the threat to other persons or law enforcement officers intensifies. The user may misperceive non-threatening actions as threatening and react with hostility and even violence.

**Crash** - To a binge abuser, the crash means an incredible amount of sleep. The body's epinephrine has been depleted, and the body uses the crash to replenish its supply. Even the meanest, most violent abuser becomes almost lifeless during the crash and poses a threat to no one. The crash can last 1-3 days.

**Normal** - After the crash, the abuser returns to normal – but that is a state that is slightly deteriorated from the normal state prior to methamphetamine use. This stage ordinarily lasts between 2 and 14 days. However, as the frequency of binging increases, the duration of the normal stage decreases.

**Withdrawal** - No acute, immediate symptoms of physical distress are evident with methamphetamine withdrawal, a stage that the abuser may slowly enter. Often 30-90 days must pass after the last drug use before the abuser realizes that he is in withdrawal. First, without really noticing, the individual becomes depressed and loses the ability to experience pleasure. The individual becomes lethargic; he has no energy. Then the craving for more methamphetamine hits, and the abuser often becomes suicidal. If the abuser, however, takes more methamphetamine at any point during the withdrawal, the unpleasant feelings will end. Consequently, the success rate for traditional methamphetamine rehabilitation is very low. Ninety-three percent of those in traditional treatment return to abuse methamphetamine.

### **High-Intensity methamphetamine abuse**

The high-intensity abusers are the addicts, often called “speed freaks”. Their whole existence focuses on preventing the crash, and they seek that elusive, perfect rush - the rush they had when they first started smoking or injecting methamphetamine.

With high-intensity abuse, each successive rush becomes less euphoric, and it takes more methamphetamine to achieve it. Each high is not quite as high as the one before. During each subsequent binge, the abuser needs more methamphetamine, more often, to get a high that is not as good as the high he wants or remembers.

Tweaking for the high-intensity abuser is still the most dangerous time to confront him because tweakers are extremely unpredictable and short-tempered. In an attempt to appear normal, perhaps because of an appointment with a doctor, lawyer, or court official, high-intensity abusers will make themselves take short naps; otherwise, they see no need to come down from the high.

High-intensity abusers are usually thin, pale and sweaty. They often have scars or open sores on their bodies because they've tried to scratch off the hallucinatory "crank bugs" they think are crawling on their skin. The methamphetamine-induced paranoia also contributes to visual distortions that some chronic meth users refer to as "shadow people."

## **Dangerous Tweakers**

A methamphetamine abuser is most dangerous when tweaking. When tweaking, the abuser has probably not slept in 3-15 days and consequently will be extremely irritable. The tweaker craves more methamphetamine, but no dosage will help re-create the euphoric high. The result is a strong feeling of uncontrollable frustration that makes the tweaker unpredictable and dangerous. It is essential to avoid approaching a tweaker in a confrontational manner.

It may be difficult to recognize the symptoms of tweaking, as users often appear normal. In fact, unlike a person intoxicated on alcohol with glassy eyes, slurred speech, and difficulty even standing up, a tweaker appears super-exaggerated normal. The tweaker's eyes are clear, his speech concise, and his movements brisk. However, some symptoms of tweaking are rapid eye movements, eye rolling, speech that is extremely rapid, often with a slight quiver, and movements that are quick and jerky. The individual's movements are often exaggerated because he is overstimulated, and his thinking is scattered and subject to paranoid delusions. The tweaker does not need provocation to react violently; however, confrontation increases the chance for a violent reaction.

Besides confrontation, it is difficult to ascertain what will trigger a tweaker to be irrational and violent. A tweaker exists in his own world, seeing and hearing things that no one else can perceive. His hallucinations are so vivid that they seem real.

If the tweaker has chosen to ease his discomfort with alcohol, he becomes a disinhibited tweaker, making reasoning with him or even identifying him as a tweaker more difficult. Physical signs of a tweaker become blurred to an observer when the tweaker is using alcohol. Motor and speech functions, for example, become impaired, but not to the degree of a person using only alcohol. The rapid eye movement and the quick speech of a tweaker might actually slow to an apparently normal speed. However, a tweaker using alcohol can be identified by a horizontal-gaze nystagmus. This phenomenon occurs when the methamphetamine abuser, who is also using alcohol, looks out of the corner of his eyes, and the eyes jerk back and forth. If communication lines are open with the tweaker, ask the tweaker if he is using methamphetamine and then inquire if he is also drinking alcohol.

If you believe that someone is tweaking, be careful how you handle the situation. Keep in mind these six safety tips for approaching a tweaker:

1. Keep your distance. Coming too close can be perceived as threatening
2. No bright lights. The tweaker is paranoid and strong stimuli may cause them to react violently
3. Slow your speech, keep your voice calm and low.
4. Slow your movements. The tweaker is paranoid and may misunderstand quick motions
5. Keep your hands visible so that the tweaker does not feel threatened
6. Keep the tweaker talking. A tweaker who falls silent can be extremely dangerous. Silence often means that his paranoid thoughts have taken over reality, and anyone present can become part of the tweaker's paranoid delusions.

If you are threatened, call the police and tell them that the person may be under the influence of meth or other drugs.

## **What Other Problems Can Occur from Methamphetamine Addiction?**

Cities across the U.S. report increased percentages of domestic violence incidents associated with meth use. Domestic disputes, ordinarily regarded as dangerous situations for law enforcement, become intensified when a meth abuser is involved because of that individual's unpredictability.

Many motor vehicle accidents and violations may also involve meth abusers. Paranoid and hallucinating, tweakers may decide to travel in their automobiles. Their delusional state makes moving shapes and shadows appear threatening and they are very likely to increase their speed and exhibit erratic driving patterns as they attempt to evade the images. An additional threat stems from the tweakers' tendency to arm themselves for their personal safety. Interview with meth abusers have confirmed that these individuals often keep weapons in their automobiles as well as their residences.

Tweakers may also be present at raves or parties. In addition, to support their habit, tweakers often participate in spur-of-the-moment crimes such as purse-snatching, strong-arm robberies, assaults with a weapon, burglaries, and theft of motor vehicles.

### **When Meth is Manufactured, Everyone Pays**

The Methamphetamine Awareness and Prevention Project (MAPP) in South Dakota notes the following costs, both economic and in destruction of lives, that are being seen in this state.

#### **Meth costs to families**

Meth poses tremendous risks to those living with an abuser. More and more often, meth abuse is a contributing factor in cases of domestic violence, child neglect, and child abuse

#### **Meth costs to healthcare systems**

- Hospital and ambulatory care
- Drug exposed infants
- Dental care
- HIV/AIDS
- Hepatitis B and C
- Crime victims' health care
- Health care for addicts' children

#### **Meth costs to taxpayers**

- Police, Fire and EMT Departments time and training costs (\$4000 per person for 2 week training)
- Cost of specialized equipment
- Hazmat suits - \$50 each, discarded after one use
- Disposable gloves - \$100 per case
- Fume detectors - \$10,000 each
- Lawyer fees – public defender costs start at \$69 per hour
- Jail/prison time and costs

#### **Meth costs to the environment**

- Lab clean-up averages \$5000 to clean up each lab, but costs can run as high as \$20,000
- Toxic wastes dumped down drains, in storm sewers, in dumpsters, on the ground or along roadsides
- Removal of topsoil in dumpsite clean-up

#### **Meth costs to businesses**

- Inventory loss and industrial theft
- Increased insurance, security, and increased workers compensation costs and claims.
- Lower productivity of employees, both abusers and family members
- Drug-abuse- related illnesses
- Premature death of worker (addict)
- Productivity loss of victims of addicts' crimes
- Shoplifting – especially of key ingredients of meth

#### **Meth costs to communities**

- Increased crime, including stealing to obtain money for meth, property damage and loss due to fires, motor vehicle accidents and assaults
- Landlord/homeowners costs to clean up after a lab bust – including replacing carpets, painting, replacing drywall, cleaning or replacing appliances

The manufacture of methamphetamine has a severe impact on the environment. The production of one pound of methamphetamine releases poisonous gas into the atmosphere and creates 5 to 7 pounds of toxic waste. Many lab operators dump the toxic waste down household drains, in fields and yards, and on rural roads.

Due to the creation of toxic waste at meth production sites, many first responder personnel are injured when dealing with hazardous substances. The most common symptoms suffered by first responders when they raid meth labs are respiratory and eye irritations, headaches, dizziness, nausea and shortness of breath.

## **Children of Meth Users**

Children are particularly vulnerable to the health effects associated with meth labs. Children are generally more at risk than adults to environmental hazards because:

1. they have immature organ systems, faster metabolic rates, and weaker immune systems
2. they eat more food, drink more fluids and breathe more air per pound of body weight
3. they are less able to protect themselves
4. their behaviors (crawling, dirt eating, hand-to-mouth) expose them to more hazards.

Drug Enforcement Administration (DEA) data showed that 30% of labs nationwide, and 50% of Minnesota labs had children living in them at the time of seizure. Illegal meth labs pose the greatest danger to children living where drugs are made. Children in meth labs are exposed to the highest levels of chemicals. They are at risk of explosion, fire, chemical burns, and are often neglected and abused by drug-using parents.

Other hazards to children in these chaotic environments may include exposure to weapons, other drugs and unsanitary conditions. Children in adjacent apartments, and those who live in former lab properties that have not been adequately cleaned are also at risk. Additionally, growing evidence shows risk to fetuses from exposure to ingested drugs and toxic chemicals in the home environment. Studies in Washington, Iowa and California, show that childhood exposure to toxic meth lab chemicals can result in damage to kidneys, liver or spleen, and may lead to violent behavior. Absorption of methamphetamine through the skin may cause rapid heart rate, hypertension, seizures, or solvent intoxication. Therefore, children taken from meth lab environments should be evaluated at a hospital or clinic.

## **Under New South Dakota Anti-Meth Law, Drug Use Equals Child Abuse**

Under a bill passed by the South Dakota legislature as an anti-methamphetamine measure, people who use or distribute any hard drug in a location where children are present can be criminally charged with child abuse and neglect and be faced with civil proceedings to have their children taken away. The law builds on a measure passed by the 2005 Legislature that made cooking methamphetamine where children are present prima facie evidence of child abuse or neglect. South Dakota law already includes a provision defining illicit drug use or "abusive" alcohol use by pregnant women as child abuse. Under the law, a child is defined as abused or neglected if his or her "parent, guardian, or custodian knowingly exposes the child to an environment that is being used for the manufacture, use, or distribution of methamphetamines or any other unlawfully manufactured controlled drug or substance."

The measure was proposed by a state methamphetamine task force and championed by Gov. Mike Rounds. The 33-member task force included law enforcement, social service, medical, and drug treatment contingents.

"There is a significant risk to children where drugs are being used or distributed," Secretary of Human Services Betty Oldenkamp told legislators in one hearing. "Parents or caregivers have diminished capacity to provide care or nurture. There is a risk of second-hand smoke, there is a risk of needle-sticks and HIV transmission, there is the potential for the involvement of firearms. Children whose parents abuse drugs or alcohol are three times more likely to be abused and four times more likely to be neglected. HB 1258 seeks to remove any and all doubt that knowingly exposing children to a drug-oriented environment is within the definition of an abused or neglected child. It sends a strong message to the public that this constitutes abuse and neglect."

The measure is not limited to methamphetamines because the state is looking ahead, said Oldenkamp. "This was brought to our attention through the meetings of the methamphetamine task force, but the trend may move on to other drugs -- that's why all illicit drugs are included. But the measure does not include marijuana and it does not include drugs obtained through legal distribution," she added.

## **An Act limiting the sale of products containing pseudoephedrine or ephedrine**

Also during the last legislative session, legislators voted to place restrictions on the sale of cold and allergy medications. Products containing the ingredients pseudoephedrine or ephedrine must be sold from a restricted area, behind the pharmacy counter or in locked cabinets. Purchases of these products will be limited to 2 per customer. This legislation goes into effect July 1, 2005. Such legislation, pioneered in Oklahoma, is credited with reducing the number of meth labs and methamphetamine production significantly in the state. To date, Oklahoma authorities report a dramatic and ongoing reduction in the number of meth labs in the state, including an immediate 25 percent drop in the initial months after the law went into effect in April 2004. That figure has since grown to 81 percent, according to Mark Woodard of the Oklahoma

Bureau of Narcotics. A number of other states have taken notice of Oklahoma's success and are enacting similar laws, as has South Dakota.

Additionally, four states, including neighboring Montana, have established Internet registries listing the names of people convicted of making or selling methamphetamine. State officials say the list helps warn property-owners against renting or selling to people previously convicted of operating meth labs. The lists are similar to state sex-offender lists, including names, dates of birth, offenses, and date and location of convictions.

**Meth Treatment Admissions**

Amphetamines and methamphetamine are central nervous system stimulants. They were the primary substance of abuse in more than 124,000 substance abuse treatment admissions in 2002 (almost 7 percent of all admissions). Methamphetamine was the primary drug of abuse reported in more than 90 percent of these admissions in 2002.

During 2000, meth treatment admissions accounted for 4.1% of total admissions or 66,052. Those admitted for meth were primarily white (79%) and male (53%) Between 1992 and 2002, the primary methamphetamine/ amphetamine admission rate in the United States increased from 10 to 52 admissions per 100,000 of the population aged 12 or older.

Also, in 1992, 12 percent of primary methamphetamine/amphetamine admissions reported smoking as the primary route of administration, but by 2002, 50 percent did.

By 2002, 19 States had rates in excess of the national rate (52 admissions per 100,000 population), and 12 had primary methamphetamine/amphetamine admission rates of more than twice the national rate—104 or more admissions per 100,000 population. Ten of the 19 states were in the West, 7 were in the Midwest, and 2 in the South. The highest primary methamphetamine/amphetamine admission rate was in Oregon—324 admissions per 100,000.

For the mid-west area, admission rates were compared from 1992 to 2002:

<b><i>Hospital admission rates for methamphetamine per 100,000 for Mid-West States 1992 vs 2002</i></b>					
	<b>1992</b>	<b>2002</b>		<b>1992</b>	<b>2002</b>
Illinois	2.0	13.4	Missouri	5.2	86.2
Iowa	9.2	198.1	Nebraska	6.8	102.2
Indiana	1.6	22.8	North Dakota	2.3	64.4
Kansas	9.8	61.3	Ohio	5.3	1.9
South Dakota	4.0	65.9	Wisconsin	.04	3.5

**What treatments are effective for methamphetamine abusers?**

At this time the most effective treatments for methamphetamine addiction are cognitive behavioral interventions. These approaches are designed to help modify the patient's thinking, expectancies, and behaviors and to increase skills in coping with various life stressors. Methamphetamine recovery support groups also appear to be effective adjuncts to behavioral interventions that can lead to long-term drug-free recovery.

There are currently no particular pharmacological treatments for dependence on amphetamine or amphetamine-like drugs such as methamphetamine. The current pharmacological approach is borrowed from experience with treatment of cocaine dependence. Unfortunately, this approach has not met with much success since no single agent has proven efficacious in controlled clinical studies. Antidepressant medications are helpful in combating the depressive symptoms frequently seen in methamphetamine users who recently have become abstinent.

There are some established protocols that emergency room physicians use to treat individuals who have had a methamphetamine overdose. Because hyperthermia and convulsions are common and often fatal complications of such overdoses, emergency room treatment focuses on the immediate physical symptoms. Overdose patients are cooled off in ice baths, and anticonvulsant drugs may be administered also.

Acute methamphetamine intoxication can often be handled by observation in a safe, quiet environment. In cases of extreme excitement or panic, treatment with anti-anxiety agents such as benzodiazepines has been helpful, and in cases of methamphetamine-induced psychoses, short-term use of neuroleptics has proven successful.

## **Methamphetamine treatment takes more time**

People who use or abuse methamphetamine do not necessarily need specialized treatment but do need more time in intensive outpatient or residential drug treatment than currently occurs.

A multidisciplinary team of University of Iowa researchers made the recommendation in a review article that appeared in the April 2003 issue of the *Journal of Substance Abuse Treatment*. The team also identified areas of research that could help improve treatment, including retention and new drug therapies.

Improving treatment is critical as meth abuse has increased in the past decade. "In reviewing studies we found that treatment does work if you can give people sufficient access to treatment," said James Hall, Ph.D., UI Associate Professor of Pediatrics, Social Work, Public Health and Nursing and one of the review authors. "We were worried that you need a special care ward or other special setting, but at least based on the data we reviewed, that doesn't seem to be the case."

Although much is known about the chemistry of methamphetamines and its acute pharmacological effects, the literature on the clinical course, the interaction of patients with the treatment system, and the outcomes of treatment is very sparse. A Methamphetamine Treatment Clinical Course (MTCC) has been established to collect data on meth abuse, and treatment outcomes. Results are expected in early 2007.

What seems to make a difference is time. Methamphetamine's effects can last up to six months for just one use, and the drug can do greater damage to a person's physical, behavioral and thinking functions than many other illicit drugs or alcohol. For this reason, it takes much longer to treat a person with a meth addiction than it does to treat someone with a cocaine or heroin problem. This time factor is also one reason why so many meth treatments currently fail.

Most adult residential drug treatment programs -- the essential first stop for breaking an addiction -- have been shortened from 45 or 30 days to only 10 to 14. The problem is even worse for adolescents. Residential treatment programs for that age group have "dried up" due to budget cuts, Hall said.

"If you are a regular meth user, you will need more time to detox before you can accept the treatments, which are very cognitive," he said. "We don't know exactly how long you need, but we do know the current two-week time isn't sufficient. Likely, a minimum of 30 days of residential treatment allows the meth abuser to regain essential thinking and decision-making skills."

The article calls on researchers to study what residential treatment length would be effective for meth users to then take advantage of outpatient care. Most state and insurance programs will not pay for treatment beyond two weeks, so even if a medical need is confirmed, funding needs also must be addressed, Hall said. In addition, there are few prison treatment programs for substance abuse.

"The emphasis on dealing with meth has been punishment and imprisonment, but we may do well as a society to reserve prison for those who are involved in illegal drug sales or violence and support treatment for abusers," Hall said. Hall and colleagues also support investigating whether certain prescription drugs might be used to treat meth abuse.

It is important to know that no single treatment approach is appropriate for all individuals. Finding the right treatment program involves careful consideration of such things as the setting, length of care, philosophical approach and the individual's needs.

## **11 Questions to Consider When Selecting a Treatment Program**

1. What insurance does the program accept? Are they willing to work on a payment plan or find other means of support for the client?
2. Is the program run by state-accredited, licensed, trained professionals?
3. Does the program encompass the full range of needs of the individual – medical, including infectious disease; psychological, including co-occurring mental illness; social; legal; vocational, etc?
4. Does the facility address sexual orientation and physical disabilities as well as provide age, gender, and culturally appropriate treatment services?
5. Is long-term aftercare support provided?
6. Is there ongoing assessment of an individual's treatment plan to ensure it meets changing needs?
7. Does the program employ strategies to engage and keep individuals in longer-term treatment, increasing the likelihood of success?

8. Does the program offer counseling (individual or group) and other behavioral therapies to enhance the individual's ability to function in the family and community?
9. Does the program offer medication as part of the treatment regimen, if appropriate?
10. Is there ongoing monitoring of possible relapse to help guide patients back to abstinence?
11. Are services or referrals offered to family members to ensure they understand addiction and the recovery process to help them support the recovering individual?

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The U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment (CSAT) provides a toll-free, 24-hour treatment referral service to help locate treatment options near you. Call: 1-800-487-4889 (TDD) • 1-877-767-8432 (Spanish) • <http://findtreatment.samhsa.gov>

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Drug Rehab Centers: <http://www.drugrehab.org>

Meth Resources – <http://methresources.gov/>

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### **Course Goals**

- 1. Readers will gain knowledge of the scope of the methamphetamine abuse problem in the U.S.**
- 2. Readers will be able to identify symptoms of short-term and long –term abuse of methamphetamines.**
- 3. Readers will learn current treatment recommendations and modalities for methamphetamine addiction.**

# HOMESTUDY POST TEST

**Circle the Correct Answer for Each Question**

All questions are based on information contained in this study.

1. Methamphetamine is a:
  - a) depressant
  - b) stimulant
  - c) narcotic
  - d) derivative of cocaine
2. The "high" from one episode of
  - a) 20-30 minutes
  - b) 2-4 hours
  - c) 6-8 hours
  - d) more than 24 hours
3. Methamphetamine has been used legally to treat which of the following disorders:
  - a) allergies
  - b) narcolepsy
  - c) obesity
  - d) all of the above
4. In 2002, women made up which percentage of treatment admissions for methamphetamine?
  - a) 12%
  - b) 29%
  - c) 47%
  - d) 62%
5. Methamphetamine can be used by:
  - a) smoking
  - b) snorting
  - c) injecting
  - d) drinking
  - e) all of the above
6. "Ice" is a slang term for:
  - a) methamphetamine
  - b) crystal meth
  - c) amphetamine
  - d) methodone
7. "Ice" is used by:
  - a) snorting
  - b) injection
  - c) smoking
  - d) all of the above
8. Short-term effects of meth usage include:
  - a) decreased appetite
  - b) lethargy
  - c) relaxation
  - d) slower respiration
9. Long-term effects of meth usage include:
  - a) hallucinations
  - b) repetitive motor activity
  - c) paranoia
  - d) all of the above
10. In 2002, the national rate of hospital admissions for meth abuse per 100,000 population aged 12 or over was:
  - a) 52 per 100,000
  - b) 27 per 100,000
  - c) 17 per 100,000
  - d) none of the above
11. "Tweaking" is:
  - a) the most dangerous stage of the abuse cycle
  - b) the phase requiring the most sleep
  - c) when the "high" sets in
  - d) when the user returns to normal
12. Which of the following is NOT an indication of meth abuse:
  - a) aggression
  - b) rapid eye movements
  - c) anxiety
  - d) slow deliberate movements
13. Complications of meth abuse include:
  - a) tooth decay
  - b) skin lesions
  - c) stroke
  - d) all of the above
14. The most effective treatment for methamphetamine addiction is:
  - a) pharmaceutical
  - b) behavioral/cognitive
  - c) insight-oriented therapy
  - d) none of the above
15. To be successful, treatment for meth addiction requires:
  - a) special treatment facilities
  - b) longer term treatment
  - c) specially trained staff
  - d) all of the above

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