

Marijuana and The Brain

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Presentation Guide: Marijuana and The Brain

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Overhead 2

Current Statistics

- 92% of arrested juveniles tested positive or marijuana
- 14% of those also tested positive for cocaine.
- 30% of incarcerated adult felony offenders have been incarcerated as juveniles
- 50 to 80% of incarcerated juveniles have learning disabilities
- 50 – 75% of all incarcerated juveniles have a mental health disorder

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Description

- Although many people believe marijuana is harmless SPECT (Single Photon Emission Computerized Tomography) scans reveal that marijuana severely limits the amount of blood that reaches the brain, reducing its levels of oxygen and nutrients. SPECT scans of chronic users show diminished activity in the entire brain and very low activity in the temporal lobes, which is related to problems with memory, temper control and learning..

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Description

Recent studies show that even after a chronic user stops smoking, that person still shows significant problems with memory, reaction time and manual dexterity. SPECT allows us to observe blood flow in the brain and indirectly, brain activity. A radioactive isotope is introduced into the blood stream, so we can capture an image of where that isotope ends up in the brain

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Description

The apparent “holes” in the brain are areas with limited blood flow related to inactivity, not missing tissue. Using these images, physicians have been able to correlate certain patterns of brain activity with certain psychiatric, substance abuse and neurological illnesses and diagnoses.

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Marijuana: a safe high?

Healthy brain

Brain of a chronic smoker (Quartz laser)

These images are SPECT scans showing the difference between a normal brain and the brain of a chronic user.

SPECT - Single Photon Emission Computed Tomography - allows us to observe blood flow in the brain and, indirectly, brain activity. A radioactive isotope is introduced into the blood stream, so we can capture an image of where that isotope ends up in the brain.

Although many people believe marijuana is harmless, SPECT scans reveal that marijuana severely limits the amount of blood that reaches the brain, reducing its levels of oxygen and nutrients. SPECT scans of chronic users show diminished activity in the entire brain and very low activity in the temporal lobes (the "feel" center in the brain), which is related to problems with memory, reaction time, and learning. Recent studies show that even after a chronic user stops smoking, that person still shows significant problems with memory, reaction time, and manual dexterity.

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Summary of Recent Research

<p>Eubanks, L.M., et al. (2006) A Molecular Link between the Active Component of Marijuana and Alzheimer's Disease Pathology. <i>Molecular Pharmacology</i></p>	<p>The Scripps Research Institute scientists have found that marijuana is more effective at blocking an enzyme that causes the brain damage common to Alzheimer's disease than approved drugs already on the market.</p> <p>These researchers found that low doses of THC seem to inhibit the enzyme that breaks down acetylcholine, a brain chemical related to learning and memory. The THC also appears to inhibit or prevent the formation of fibrils, which cause damage to healthy brain tissue.</p> <p>Lead researcher Kim Janda stated that no suggestion was being made to smoke Marijuana but on the other hand, she said that the study suggests that the active ingredient in marijuana "could prevent fibrils or plaque formation" and that THC "can directly impact Alzheimer's disease pathology."</p>
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Summary of Recent Research

<p>Cha, Y.M., et al. (2006) Differential effects of delta9-THC on learning in adolescent and adult rats. <i>Pharmacology Biochemistry and Behavior</i>, 83(3): 349-480.</p>	<p>Researchers from Duke University and Durham Veterans Affairs Medical Center administered THC, to adolescent and adult rats. The purpose of the study was to measure THC effect on their ability to remember and complete a task. The researchers found that the adolescent rats under the influence of THC took 64 percent longer to complete a task than the adult rats given the drug.</p> <p>When the drug was removed, the researched findings disappeared; a control group of rats not given the drug completed the task with no difficulties.</p> <p>The younger rats, who model human adolescents, show serious impairments according to lead study author Young May Cha. "That should definitely send a red flag to anyone who's thinking of using THC."</p> <p>In response, a spokesperson for the National Organization for the Reform of Marijuana Laws said that similar research has been conducted before and that studies have found no long-term impairment arising from youth marijuana use. But, senior policy analyst Paul Armentano said; "NORML does not believe, as any responsible organization, that the use of intoxicating substances, including marijuana, is a good idea for children."</p>
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Summary of Recent Research

<p>American Thoracic Society International Conference Presentation (May, 2006)</p>	<p>Researchers found that while smoking cigarettes greatly increased the risk of lung cancer, smoking marijuana did not seem to have the same effect.</p> <p>The researchers from the UCLA David Geffen School of Medicine indicated they were taken aback by the findings, as we know there many carcinogens and co-carcinogens in marijuana smoke as in cigarettes. According to researcher Donald Tashkin, he went on to say "But we did not find any evidence for an increase in cancer risk for even heavy marijuana smoking."</p> <p>The research involved subjects aged 60 and younger, including 611 lung-cancer patients and 601 patients with other cancers of the head and neck. The cancer patients were compared to a control group of 1,040 people without cancer.</p>
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Summary of Recent Research

<p>American Thoracic Society International Conference Presentation (May, 2006) - con't</p>	<p>Heavy marijuana smokers were defined as those who self-reported smoking more than 22,000 marijuana joints during their lifetime. The researchers found that people who smoked two packs of cigarettes per day increased their cancer risk twentyfold, but even the heaviest marijuana smokers had no elevated risk. They also indicated that cancer risk among cigarette smokers rose in direct proportion to how much they smoked.</p> <p>Previous studies have found that marijuana smoke has high levels of carcinogens, and that marijuana smokers inhale deeply, which would be expected to increase their cancer risk. Some now believe that the THC in marijuana may have some protective properties that prevent cancers from forming or thriving.</p>
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Summary of Recent Research

<p>Messinis, L., Kyprianidou, A., Malefaki, S. and Papathanasopoulos, P. (2006) Neuropsychological deficits in long-term frequent cannabis users. <i>Neurology</i>, 66: 737-739.</p>	<p>Memory, attention, and verbal fluency appear to suffer among regular, long-term marijuana users.</p> <p>A study conducted by a team of researchers from the University Hospital in Patras, Greece determined that people who smoked at least four joints or more per week tended to perform poorly on mental tests, and those who had smoked regularly for a decade or more did the worst. "The longer you smoke marijuana, the more likely you are to experience a diminution of cognitive functions that are critical for 'normal' daily functioning," said Barbara Flannery, an addiction researcher.</p> <p>Researchers found, for example, that long-term marijuana users were impaired 70 percent of the time on a decision-making test, compared to 55 percent for short-term users and 8 percent for nonusers.</p> <p>The authors of the study cautioned that the purported link between marijuana and reduced mental functioning is far from definitive.</p>
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Summary of Recent Research

<p>NIDA (2005)</p>	<p>Men and women who smoked marijuana before age 17 are 3.5 times as likely to attempt suicide as those who started later. Individuals who are dependent on marijuana have a higher risk than nondependent individuals of experiencing major depressive disorder and suicidal thoughts and behaviors.</p> <p>More Americans suffer from marijuana-related disorders now than a decade ago, even though the prevalence of marijuana smoking has not increased. Survey results from 2002, compared with data from a decade earlier, showed that overall, rates of marijuana consumption in adults 18 and older held relatively steady at 4 percent of respondents.</p>
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Summary of Recent Research

NIDA (2004)	In 2004, 14.6 million Americans age 12 and older used marijuana at least once in the month prior to being surveyed. About 6,000 people a day in 2004 used marijuana for the first time—2.1 million Americans. Of these, 63.8 percent were under age 18. In the last half of 2003, marijuana was the third most commonly abused drug mentioned in drug-related hospital emergency department (ED) visits in the continental United States, at 12.6 percent, following cocaine (20 percent) and alcohol (48.7 percent).
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Summary of Recent Research

NIDA (2002)	Marijuana's effects include diminished blood flow to the entire brain; diminished temporal lobe activity, which is related to problems with memory, temper control, and learning; significant problems with verbal and visual memory, a diminished ability to switch between concepts, slowed reaction speed, and loss of manual dexterity.
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Summary of Recent Research

Lundqvist, T. (1995)	Chronic cannabis users seem to have symptoms such as mental confusion and memory problems.
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Summary of Recent Research

Scheier, L.M., Botvin, G.J., Popek, H.G., Jr., Yurgelun-Todd, D. (1996).	Chronic and abusive use of psychotropic compounds like marijuana may have negative consequences. For example, marijuana users might have neurological and behavioral deficits to a great degree than occasional users.
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Summary of Recent Research

Teens in Motion News (1996).	Due to increased potency, marijuana users are at risk for lung disease and development problems. Smoking can impair memory, perception, judgment, and motor skills.
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Summary of Recent Research

U.S. Dept. of Health and Human Services, (1996).	Critical skills related to attention, memory and learning are impaired among heavy users of marijuana, when comparing them to light users. For example, a few specific cognitive functions affected by marijuana use are: intellectual functioning, abstraction ability, attention span, and verbal fluency, ability to learn and recall new information.
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Restoring Justice in a Community of Crime

by Janine P. Geske and India McCanse

This article relates to “talking circles” held in the Milwaukee community with offenders returning from prison as well as first-time offenders who get a second chance to “get it right” before they may be prosecuted and imprisoned.

Participants gathered on the north side of the city, where most of Milwaukee’s violent crime occurs. There were two dozen members of the community and eight special guests—offenders of severe violence returning to this community from prison. They sat in a traditional Native American talking circle on the second floor of an old Milwaukee bank that is now a community treasure for this poor, African-American neighborhood. With a lighted candle in the center, the facilitator laid out the purpose of the gathering and explained the restorative practice of meeting in a circle. Gathered in this meeting are victims of crime, neighborhood residents, the community prosecutor, faith leaders, business owners, police officers, parents of local school children, and a federal prosecutor who leads the Safe Streets Initiative. For the next two hours, participants reflected on how

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Adolescent Marijuana Treatment: Thirteen Evidence-Based Treatment Principles for Criminal Justice Populations

by Henry R. Cellini

Correctional professionals understand addiction and addictive behavior as a result of the large number of offenders with substance abuse problems. In the past decade, the National Institute on Drug Abuse (NIDA), the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention (OJJDP), and the Substance Abuse and Mental Health Services Administration (SAMHSA) have researched and developed evidence-based models necessary to treat, modify, or minimize substance abuse and the resulting impact on criminal behavior. In 2006, NIDA published 13 research-based principles for treating criminal justice populations.

In order to ensure basic quality “best practice” standards for programs providing services to offender populations, correctional treatment professionals now are able to draw on knowledge about how addiction changes the brain, and they must bear in mind that there is still no simple solution in sight for the millions of addicts in the United States.

A study conducted by Columbia University’s National Center on Addiction and

Substance Abuse (published in October 2004) found that of the 2.4 million minors arrested in 2000, 1.9 million had substance abuse or addiction-related problems. The report goes on to state, however, that only 68,600 juvenile delinquents that year received some form of addiction treatment. The study, conducted mainly on ten- to 17-year-olds, found that mental health services are also scarce and many educational programs for delinquents do not meet their own state’s standards. The study states that by conservative estimates, at least:

- 92% of arrested juveniles tested positive for marijuana;
- 14% of those also tested positive for cocaine;
- 30% of incarcerated adult felony offenders have been incarcerated as juveniles;
- 50% to 80% of incarcerated juveniles have learning disabilities; and

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- 50% to 75% of all incarcerated juveniles have a mental health disorder (National Center on Addiction and Substance Abuse, 2004).

The obvious implications of the study are even more disconcerting, when one realizes that early intervention and treatment are more effective and less costly than incarceration.

SAMHSA administration officials recently stated that overall drug trends are encouraging, particularly for youths. About 9.8% of those ages 12 to 17 acknowledged drug use in the past month, a level comparable to the year before; however, that is a significant drop from the 11.6% who acknowledged drug use back in 2002.

A drug-use monitoring survey was used to extrapolate drug trends of 67,500 people, "to monitor drug use in the United States as well as the use of tobacco and alcohol. About 14.6 million people ages 12 and older used marijuana in the past month, while 9.6 million used illicit drugs other than marijuana." The report went on to say:

The use of hallucinogens among youth remained stable last year, the survey indicated. But there was a statistically significant increase in the use of ecstasy among those ages 18 to 25. In that camp, 3.8% reported the

use of ecstasy within the past year. The year before, 3.1% acknowledged ecstasy use. (For more information, see www.samhsa.gov.)

Marijuana: The Plant in the Twenty-First Century

The hemp plant, *cannabis sativa*, from which marijuana is derived, is one of humanity's oldest cultivated nonfood plants. It is grown throughout the world and flourishes in temperate and tropical regions. The major psychoactive ingredient of marijuana is delta-9-tetrahydrocannabinol (THC). THC, along with over 60 other psychoactive chemicals within the marijuana plant, causes a euphoric high, which is one of the reasons that this drug is popular with many youth and adults around the world. As the most-used illicit drug in the United States, marijuana—especially when used by children and teenagers—has been a major concern of public policy officials for decades.

One of the dilemmas that prevention specialists encounter when dealing with marijuana use in their community is that many parents and other adult authority figures who used marijuana during the 1960s and 1970s do not see it as a potentially harmful drug; however, that is not the case. Unfortunately, the potency of marijuana has dramatically increased over the last two decades. The increase in

THC levels as a result of the development of new hybrid strains of marijuana has resulted in a type and intensity of marijuana today that is significantly different from that used in the 1960s and 1970s.

Short- and Long-Term Effects of Marijuana

The most common method of using marijuana is rolling it into a loose joint and smoking it. Users inhale marijuana smoke and subsequently experience dry mouth, rapid heartbeat, loss of coordination, and, ultimately, a poor sense of balance. Users also experience slower reaction times, intoxication, and frequently have a need to engage in eating binges (an effect commonly known as "the munchies").

The physiological effects of marijuana are due to the fact that THC suppresses the neurons and the information processing system, which results in problems with learning, memory, and the ability to integrate sensory experiences with emotions. A frequent marijuana smoker might experience many of the same respiratory problems that have been known to plague tobacco smokers (NIDA, 1996a, 1996b). Recent developments in neurobiological imaging have demonstrated that

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marijuana severely reduces the amount of blood that reaches the brain and reduces the brain's levels of oxygen and nutrients. In chronic marijuana users, Single Photon Emission Computed Tomography (SPECT) scans reveal diminished blood flow to the entire brain, and, specifically, diminished temporal lobe activity, which is related to problems with memory, temper control, and learning. Recent studies funded by the NIDA showed that even after a chronic user stops smoking marijuana, that person still shows significant problems with verbal and visual memory, a diminished ability to switch between concepts, slowed reaction speed, and loss of manual dexterity (NIDA, 2002).

In some individuals, smoking marijuana causes high levels of dopamine to be released. Dopamine, a neurotransmitter, causes euphoria by stimulating the pleasure sites of the brain. These reward pathways, when reinforced, stimulate the desire to use more marijuana. In fact, some researchers now believe that marijuana should be considered not just psychologically but physically addictive, because it has such strong and intense effects on the pleasure centers

of the brain. Others claim that marijuana is not physically addictive: one reason for that claim is related to the apparent lack of withdrawal symptoms immediately after cessation of marijuana use.

The perception that quitting marijuana use does not cause withdrawal symptoms, however, has come about because of the lengthy delay (four to six weeks) before the withdrawal symptoms manifest. Because THC is fat soluble, it remains in the body for up to six weeks; once the THC is gone, withdrawal symptoms, including anxiety, depression, and irritability, begin to surface. Consequently, despite the delay before symptoms manifest, the fact that physical side effects of withdrawal eventually appear indicates that marijuana has a physical addiction component.

What Does the Research Tell Us?

A review of the research on marijuana's potential for physical dependence shows that outright cannabis addiction, where there is obsessive drug-seeking and compulsive drug-taking behavior present, was relatively rare with the low-dose cannabis formerly used in the United States. Physical addiction is now becoming more common, however, with high-dose

products, such as hashish and hash oils, and stronger forms of marijuana (Gardner & Lowinson, 1991). Nevertheless, the fact that the less potent forms of marijuana are more commonly used in the United States means that many chronic users could eliminate their cannabis use if they so desired. (Abood & Martin, 1992). Table 1 contains a summary of significant research on marijuana from 1995 to 2006.

Evidence-Based Treatment

When designing a treatment program, providers may want to examine the assessment instrumentation currently in use and find a more modern differential assessment instrument in an effort to better identify client and family presenting problems and match them with appropriate treatment resources. The Cannabis Youth Treatment (CYT) series, volumes 1 to 5, provides assessment instruments that may be of use to the project, because this series includes both old and new instruments to monitor treatment progress as well as offering curriculum guidance. The manuals also provide treatment planning data that allow the program to use the proven

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Table 1. Summary of Recent Research

<i>Author(s) and Title</i>	<i>Findings</i>
Eubanks, L.M., et al. (2006). A molecular link between the active component of marijuana and Alzheimer's disease pathology.	The Scripps Research Institute scientists have found that marijuana is more effective at blocking an enzyme that causes the brain damage common to Alzheimer's disease than approved drugs already on the market.
	These researchers found that low doses of THC seem to inhibit the enzyme that breaks down acetylcholine, a brain chemical related to learning and memory. The THC also appears to inhibit or prevent the formation of fibrils, which cause damage to healthy brain tissue.
	Lead researcher Kim Janda stated that no suggestion was being made to smoke marijuana, but, on the other hand, she said that the study suggests that the active ingredient in marijuana "could prevent fibrils or plaque formation" and that THC "can directly impact Alzheimer's disease pathology."
Cha, Y.M., et al. (2006). Differential effects of delta9-THC on learning in adolescent and adult rats.	Researchers from Duke University and Durham Veterans Affairs Medical Center administered THC to adolescent and adult rats. The purpose of the study was to measure THC's effect on the rats' ability to remember and complete a task. The researchers found that the adolescent rats under the influence of THC took 64% longer to complete a task than the adult rats given the drug.
	When the drug was removed, the effects disappeared: A control group of rats not given the drug completed the task with no difficulties.
	The younger rats, who model human adolescents, show serious impairments, according to lead study author Young May Cha: "That should definitely send a red flag to anyone who's thinking of using THC."
	In response, a spokesperson for the National Organization for the Reform of Marijuana Laws (NORML) said that similar research has been conducted before and that studies have found no long-term impairment arising from youth marijuana use. However, NORML's senior policy analyst, Paul Armentano, said: "NORML does not believe, as any responsible organization [would not], that the use of intoxicating substances, including marijuana, is a good idea for children."

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Table 1. Summary of Recent Research (continued)

Tashkin, D. (2006). Marijuana use and lung cancer.	Researchers found that while smoking cigarettes greatly increased the risk of lung cancer, smoking marijuana did not seem to have the same effect.
	The researchers from the UCLA David Geffen School of Medicine indicated that they were taken aback by the findings, because we know that there are as many carcinogens and co-carcinogens in marijuana smoke as in cigarettes. According to researcher Donald Tashkin: "But we did not find any evidence for an increase in cancer risk for even heavy marijuana smoking."
	The research involved subjects aged 60 and younger, including 611 lung-cancer patients and 601 patients with other cancers of the head and neck. The cancer patients were compared to a control group of 1,040 people without cancer.
	Heavy marijuana smokers were defined as those who self-reported smoking more than 22,000 marijuana joints during their lifetime. The researchers found that people who smoked two packs of cigarettes per day increased their cancer risk twenty-fold, but even the heaviest marijuana smokers had no elevated risk. The findings also indicated that cancer risk among cigarette smokers rose in direct proportion to how much they smoked.
	Previous studies have found that marijuana smoke has high levels of carcinogens and that marijuana smokers inhale deeply, both of which would be expected to increase their cancer risk. Some now believe that the THC in marijuana may have some protective properties that prevent cancers from forming or thriving.
Messinis, L., et al. (2006). Neuropsychological deficits in long-term frequent cannabis users.	Memory, attention, and verbal fluency appear to suffer among regular, long-term marijuana users.
	A study conducted by a team of researchers from the University Hospital in Patras, Greece determined that people who smoked at least four joints or more per week tended to perform poorly on mental tests, and those who had smoked regularly for a decade or more did the worst. "The longer you smoke marijuana, the more likely you are to experience a diminution of cognitive functions that are critical for 'normal' daily functioning," said Barbara Flannery, an addiction researcher.
	Researchers found, for example, that long-term marijuana users were impaired 70% of the time on a decision-making test, compared to 55% for short-term users and 8% for nonusers.
	The authors of the study cautioned that the purported link between marijuana and reduced mental functioning is far from definitive, however.
NIDA (2005). <i>Research report: Marijuana abuse</i> .	Men and women who smoked marijuana before age 17 are 3.5 times as likely to attempt suicide as those who started later. Individuals who are dependent on marijuana have a higher risk than nondependent individuals of experiencing major depressive disorder and suicidal thoughts and behaviors.
	More Americans suffer from marijuana-related disorders now than a decade ago, even though the prevalence of marijuana smoking has not increased. Survey results from 2002, compared with data from a decade earlier, showed that overall, rates of marijuana consumption in adults 18 and older held relatively steady at 4% of respondents.
NIDA (2004). <i>Research report: Marijuana abuse</i> .	In 2004, 14.6 million Americans ages 12 and older used marijuana at least once in the month prior to being surveyed. About 6,000 people a day in 2004 used marijuana for the first time (2.1 million Americans). Of these, 63.8% were under age 18. In the last half of 2003, marijuana was the third most commonly abused drug mentioned in drug-related hospital emergency department visits in the continental United States, at 12.6%, following cocaine (20%) and alcohol (48.7%).
NIDA (2002). <i>Research report: Marijuana abuse</i> .	Marijuana's effects include diminished blood flow to the entire brain; diminished temporal lobe activity, which is related to problems with memory, temper control, and learning; significant problems with verbal and visual memory, a diminished ability to switch between concepts, slowed reaction speed, and loss of manual dexterity.
Scheier, L.M., et al. (1996). Cognitive effects of marijuana.	Chronic and abusive use of psychotropic compounds like marijuana may have negative consequences. For example, marijuana users might have neurological and behavioral deficits to a greater degree than occasional users.
Marijuana: It isn't safe, and it isn't cool. (1996).	As a result of increased potency of marijuana today, marijuana users are at risk for lung disease and development problems. Smoking marijuana can impair memory, perception, judgment, and motor skills.
National Institute on Drug Abuse (NIDA). (1996a). <i>Attention and memory impaired in heavy users of marijuana</i> .	Critical skills related to attention, memory, and learning are impaired among heavy users of marijuana, when they are compared to light users. For example, a few specific cognitive functions affected by marijuana use are intellectual functioning, abstraction ability, attention span, verbal fluency, and ability to learn and recall new information.
Lundqvist, T. (1995). Specific thought patterns in chronic cannabis smokers observed during treatment.	Chronic cannabis users seem to have symptoms such as mental confusion and memory problems.

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(CYT) model with this type of substance-abusing offender population.

CYT, to date, is the largest adolescent outpatient experiment ever undertaken in the United States. The CYT approach consists of a five-manual set of guided approaches for adolescent outpatient cannabis abuse treatment. The research goal of this series is to enhance knowledge development and practical application by focusing on major gaps in the treatment field. The CYT model, coupled with an ongoing, open-entry aftercare group process, seems to make sense from clinical, "best practices," and cost-effectiveness perspectives.

The adoption of motivational enhancement therapy and cognitive behavioral therapy (MET-CBT) as part of the CYT may offer an innovative approach to working with this client population and has been shown to be as effective as more traditional approaches and significantly less time consuming and expensive. Additionally, improving client retention could improve client discharge outcomes and enhance subsequent behaviors (Sampl & Kadden, 2002; Webb et al., 2002; Hamilton et al., 2002; Godley et al., 2001; Liddle, 2002).

A synopsis of the MET-CBT research has indicated that the interventions evaluated do represent distinct alternatives for adolescent substance abuse treatment in terms of modality (e.g., individual, group, and family); orientation (e.g., cognitive, behavioral, psychoeducational, and family systems); and dose (e.g., six weeks versus 12 weeks and five sessions versus 20 or more sessions). These interventions were implemented in a study that employed several features recommended for establishing efficacious behavioral interventions, including:

- Random assignment to condition;
- Independent research team interventions in different settings (including actual practice settings);
- Treatment manuals and therapist training and monitoring procedures that ensure adherence to the procedures in the manuals;
- Comparison of well-implemented interventions;
- Evaluation of outcomes with a clearly defined target population that mirrors the population found in regular practice settings; and

- Completed follow-up data over a long follow-up period (Diamond et al., 1999).

Overview of MET-CBT5 Protocol

We will now turn to a brief discussion of the MET-CBT5 model. For descriptive purposes in this article, the reader is reminded that several variations on this theme exist in each of the five manuals, with the primary differences being the number and length of sessions.

The MET-CBT5 treatment, a brief treatment approach for adolescents with cannabis-use disorders, consists of two individual motivational enhancement therapy (MET) sessions, followed by three group cognitive behavioral therapy (CBT) sessions. The two initial individual MET sessions are primarily intended to enhance adolescents' motivation to address their marijuana use and to prepare the clients for the group sessions, with an introduction to functional analysis and the concept of triggers. The purpose of the three group sessions is to assist clients in the development of skills useful for stopping or reducing marijuana use. The CBT sessions focus on the following skills:

- Learning basic refusal skills when marijuana is offered;
- Developing a plan for positive drug-free leisure-time activities;
- Developing and maintaining a prosocial network to support recovery;
- Learning how to cope with high-risk situations; and
- Recovering from a relapse, should one occur.

The establishment of rapport between the therapist and the adolescent clients is essential. The therapist facilitates this rapport by expressing a genuine interest in and nonjudgmental reactions to the adolescents' viewpoints. Therapists are encouraged to use language both familiar and similar to that of the clients. It is recommended that therapists work in accordance with the MET approach across all five treatment sessions, including the three CBT-focused group sessions. Counselors are encouraged to use MET skills throughout all five sessions for two important reasons:

Many clients will remain ambivalent about abstinence from marijuana beyond the two planned MET sessions. If the counselor continues to

use motivation-enhancing reflections and comments, however, clients will have a greater likelihood of developing motivation to quit smoking marijuana.

The MET style of intervention helps avoid the potential authoritarian power struggle of an adult counselor telling clients what they "should" do. Use of the MET style of intervention increases the chance for a collaborative counselor-offender dialogue.

With promising outcome data for each of the MET-CBT interventions, treatment experts believe that the program has great potential to advance the field of adolescent substance use/abuse disorder treatment. The treatment curriculum and protocols that the program provides are well articulated, standardized, and relatively brief and can be replicated easily in both the field and in future studies (Diamond et al., 1999).

An additional approach to consider, if community-based clients are chosen, is Multi-Systemic Therapy (MST). Demonstration sites in several states are now using this approach. The basic MST model is:

[A] family-based home-oriented program that targets chronically violent, substance-abusing juvenile offenders 12 to 17 years old. It uses methods that promote positive social behavior and decrease antisocial behavior—including substance use—to change how youth function in their natural settings (i.e., home, school, and neighborhood). The primary goals of MST are to reduce youth criminal activity, reduce antisocial behavior, including substance abuse, and achieve these outcomes at a cost savings by decreasing incarceration and out-of-home placement rates. Based on the philosophy that the most effective and ethical route to help youth is through helping their families, MST views parents or guardians as valuable resources, even when they have serious and multiple needs of their own. A "multisystemic" approach, however, views these youth as involved in a network of interconnected systems that encompass individual, family, and extra-familial (e.g., peer, school, neighborhood) factors, and recognizes that it is often necessary to intervene in more than one of these systems. MST

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addresses these factors in an individualized, comprehensive, and integrated manner (SAMHSA, 2007).

According to SAMHSA, eight randomized studies with control groups have shown that MST youth:

- Were significantly less likely to use substances;
- Had lower arrest rates for all types of offenses (20% to 70% lower);
- Spent less time in out-of-home placements (by 47% to 64%);
- Engaged in less aggression with peers;
- Showed improved family relations and functioning;
- Had an increased mainstream school attendance; and
- Were less likely to be criminally involved (SAMHSA, 2007).

In addition, the MST program demonstrated an overall considerable savings over other social services: up to \$131,000 per youth. A program combining MET-CBT and MST may increase the individual positive outcomes of each type of therapy. It is essential to remember that strict adherence to logical strategies of program design and development is not intended to limit innovation but rather, to document effective methods for others to replicate. Often we find appealing ideas replicated without any scientific backing and others funded consistently even after they have been proven ineffective. We must remember that quality treatment programs are those that in the *long-term* are cost effective and psychologically sound and that ultimately enhance public safety.

Thirteen Principles of Drug Abuse Treatment for Criminal Justice Populations

The NIDA has developed 13 science-based "best practice" principles, which are discussed here for the purpose of ensuring important guidance toward program fidelity. Therefore, treatment efforts need to be prepared to focus on the dynamic risk factors of recidivism and the biopsychological behavioral triggers associated with relapse. These 13 principles are listed below:

1. *Drug addiction is a brain disease that affects behavior.* Drug addiction has well-recognized harmful

consequences. Addictive drugs act by directly stimulating the brain's reward system through the heightened release of the neurotransmitter dopamine within the brain. The nucleus accumbens, located beneath the cerebral hemispheres (the part of the brain directly involved in dopamine reception), registers the activity as pleasurable, thereby increasing the chance that the person will repeat the activity. If the nucleus accumbens is damaged, or affected in such a way that dopamine release in the region drops, the result is a diminished reward sensation that can lead to an increase in drug use in order to regain earlier pleasurable feelings. Addiction specialists refer to this biological process as *tolerance*. By providing positive reinforcement to actions that promote survival, the nucleus accumbens plays a vital role in encouraging the survival of both the individual and the species. The nucleus accumbens is not designed to handle the flood of dopamine that addictive drugs unleash in the brain. The overwhelmed receptor cells start to shut down, causing the threshold of dopamine required to evoke a pleasurable reward to rise. As the threshold rises, normal activities can no longer elicit a reward reaction; as more drugs are used to trigger the reward reaction, the threshold rises further; and the result is an increasing spiral of withdrawal, need, and use. The addict's brain is conditioned to require and crave the addictive drug and associated stimuli.

2. *Recovery from drug addiction requires effective treatment, followed by management of the problem over time.* Drug addiction is treatable and can be managed throughout one's life. Effective drug abuse treatment is a therapeutic process that retains them in treatment for an appropriate length of time and helps them learn abstinence. Several attempts or episodes of treatment often are required for success. Outcomes for drug abusing offenders in the community can be improved by monitoring drug use and by encouraging continued participation in treatment and self-help groups.
3. *Treatment must last long enough to produce stable behavioral changes.* The drug abuser, throughout treatment, is taught to break old patterns of thinking and behaving. The purpose of this is to

learn new skills for avoiding drug use and criminal behavior. Offenders with severe drug problems and co-occurring disorders typically need longer treatment (e.g., a minimum of three to four months) plus additional services. Throughout the stages of changes, offenders address other problems related to drug abuse or co-occurring disorders and learn how best to manage their specific problems. As the new behavioral pattern becomes the standard for the client's life, the issue of preventing relapse and reoccurrence must be addressed as a formal component of treatment. As fewer treatment sessions become necessary, the issue of termination may become a therapeutic focus. With offenders in prisons and jails, their sentences often coincide with the direct termination of treatment. The process of termination is therefore different for practitioners and providers who work with adolescents or adult offenders in the community. New symptoms may appear or old ones may resurface as termination nears, prompting a request for one or more additional sessions, often when difficulties with separation or abandonment issues are part of the maladaptive pattern of offenders. Positive termination and separation can be a treatment goal for these clients.

4. *Assessment is the first step in treatment.* Justice systems should screen all adolescents at the time of arrest or detention—including "status offenders," who are not normally screened. Given the high correlation between psychological difficulty and substance use disorders, all teens receiving mental health assessment should also be systematically screened. Within other service delivery systems, runaway youth (e.g., at shelters), teens entering the child welfare system, teens who dropped out of school (e.g., in vocational/job corps programs), and other high-risk populations (e.g., special education students) should also be screened. Adolescents who present with substantial behavioral changes or emergency medical services for trauma, or who suddenly begin experiencing medical problems such as accidents, injury, or gastrointestinal disturbance, should also be screened. The screening process should last no

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more than 30 minutes (ideally, ten to 15 minutes), and the instrument should be simple enough that a wide range of health professionals can administer it. It should focus on the adolescent's substance use severity (primarily consumption patterns) and a core group of associated factors such as legal problems, mental health status, educational functioning, and living situation. The content of the test must be appropriate for clients from a variety of backgrounds and cultures, and for clients of differing ages and experiences. The panel strongly recommends that structured or semi-structured interviews be used in this field, because unstructured interviews pose special administrative problems that contribute to measurement error. Interviews should not be performed with parents present. When using paper-and-pencil questionnaires, the screener should have the client read aloud the instructions that accompany the test to ensure that the client understands what is expected of him or her and to judge whether the client's reading ability is appropriate for the testing situation. There is no definitive rule as to how many uncovered red flags indicate a need for a comprehensive assessment. Many screening questionnaires provide empirically validated cut scores to assist with this decision. Nevertheless, any time that there are several red flags or a few factors that appear to be meaningful, the screener should refer the adolescent for a comprehensive assessment.

➤ 5. *Tailoring services to fit the needs of the individual is an important part of effective drug abuse treatment for criminal justice populations.* People have many differences, including age, gender, ethnicity and culture, problem severity, recovery stage, and level of supervision needed. People also respond differently to different treatment approaches and treatment providers. Drug treatment must address important issues like motivation and problem solving; how to resist drug use and future criminal behavior and what kinds of constructive behavior with which to replace drug use and criminal activities. Biopsychosocial treatment interventions can aid in the development of prosocial interper-

sonal relationships and improve the offenders' ability to interact with family and the community.

6. *Drug use during treatment should be carefully monitored.* Offenders trying to recover from drug addiction often experience a relapse to drug use. Emotional cognition triggers for drug relapse are varied: Common ones include mental stress and associations with peers and social situations linked to drug use. An undetected relapse can progress to serious drug abuse, but detected use can present opportunities for therapeutic intervention. Monitoring drug use through urinalysis, sweat patch, or other objective methods as part of treatment or criminal justice supervision provides a basis for assessing and providing feedback on the participant's treatment progress. It also provides opportunities to intervene to change unconstructive behavior; determining rewards and sanctions to facilitate change and modifying treatment plans according to progress.

7. *Treatment should target factors that are associated with criminal behavior.* Criminogenic thought patterns are a combination of attitudes and beliefs that support a criminal lifestyle and behavior. These can include feeling and leading themselves to believe that:

- They are entitled to have everything their own way;
- Their criminal behavior is justified;
- They do not have to be responsible for their actions; and
- They can consistently neglect to anticipate or appreciate the consequences of their behavior.

This pattern of thinking often contributes to drug use and criminal behavior. Treatment that provides specific cognitive skills training to help individuals recognize errors in judgment that lead to drug abuse and criminal behavior may improve outcomes.

8. *Criminal justice supervision should incorporate treatment planning for drug abusing offenders with treatment providers aware of correctional supervision requirements.* The coordination of drug treatment with correctional planning can encourage participation in drug abuse treatment and help treatment providers incorporate correctional supervision and reporting requirements

as treatment goals. Collaboration should occur between treatment providers and criminal justice staff to evaluate each individual's treatment plan and ensure that it meets correctional supervision requirements as well as that person's changing needs, which may well include housing; child care; medical, psychiatric, and social support services; and vocational and employment assistance. For prison-housed offenders with drug abuse problems, planning should incorporate the transition to community-based treatment and links to appropriate post-release services to improve the success of drug treatment and reentry. Abstinence requirements may necessitate a rapid clinical response, such as more counseling, targeted intervention, or medication to prevent relapse. Ongoing coordination between treatment providers and courts or parole and probation officers is important in addressing the complex needs of these reentering individuals.

9. *Continuity of care is essential for drug abusers reentering the community.* Those who complete prison-based treatment and continue with treatment in the community have the best outcomes. Continuing drug abuse treatment helps the recently released offender deal with problems that become relevant only at reentry, such as learning to handle situations that could lead to relapse, learning how to live drug-free in the community, and developing a drug-free peer support network. Treatment in prison or jail can begin a process of therapeutic change, resulting in reduced drug use and diminished criminal behavior post-incarceration. Continuing drug treatment in the community is essential to sustaining these gains and maintaining a drug-free lifestyle.

10. *A balance of rewards and sanctions encourages prosocial behavior and treatment participation.* When providing correctional supervision of individuals participating in drug abuse treatment, it is important to reinforce positive behavior. Social reinforcers, such as recognition for progress or sincere effort, can be effective, as can graduated sanctions that are consistent, predictable, and clear responses to noncompliant behavior. Generally,

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less punitive responses are used for early and less serious noncompliance, with increasingly severe sanctions being used for continued problem behavior. Rewards and sanctions are most likely to have the desired effect when they are perceived as fair and when they are implemented very soon after the behavior that they are intended to change.

11. *Offenders with co-occurring drug abuse and mental health problems often require an integrated treatment approach.* With high rates of mental health concerns and substance abuse problems in the offender population, most treatment programs need to consider a dual diagnosis model. Personality, cognitive, and other serious mental disorders can be difficult to treat and may disrupt drug treatment. The presence of co-occurring disorders may require an integrated approach that combines drug abuse treatment with psychiatric treatment, including the use of medication. Individuals with either a substance abuse or a mental health problem should be cross-screened/assessed for the presence of the other problem.
12. *Medications are an important part of treatment for many drug abusing offenders.* Medicines such as methadone and buprenorphine for heroin addiction have been shown to help normalize brain function and should be made available to individuals who could benefit from them. The use of medications can also be instrumental in enabling people with co-occurring mental health problems to function successfully in society. Behavioral strategies can increase adherence to medication regimens. Although their use with adolescents is still controversial (Raeburn, 2007), selective serotonin reuptake inhibitors (SSRIs) are helpful when used appropriately under careful supervision.
13. *Treatment planning for drug abusing offenders who are living in or reentering the community should include strategies to prevent and treat serious, chronic medical conditions, such as HIV/AIDS, hepatitis B and C, and tuberculosis.* Infectious disease rates for hepatitis, tuberculosis, and

HIV/AIDS are higher in drug abusers, incarcerated offenders, and offenders under community supervision than in the general population. These infectious diseases affect not just offenders, but their families, the criminal justice system, and the public. Federal and state laws have guided drug-involved offenders to take advantage of free testing for infectious diseases and receive counseling on their health status and instruction on how to modify their risky behaviors. Probation and parole officers who monitor these offenders with serious medical conditions are taught to link them with health care services and to encourage compliance with medical treatment. They also help offenders reestablish their eligibility for public health services (e.g., Medicaid, county health departments), often before their release from prison or jail.

These 13 principles must be seen as general guideposts for quality treatment. Each local community must determine how best to design, implement, and maintain its own "best practices" intervention and treatment programs. It is important not to forget that the reduction of recidivism and relapse factors is a central and crucial goal of treatment.

Design and Implementation: The Keys to Success

An effective treatment program should be behavioral in nature and focus on strategies that include social learning, cognitive skill-building techniques, and methods with predetermined measurable outcomes. The treatment effort needs to be substantial, especially in the high-risk group. Some offenders do seem to benefit from a less intensive and expensive program that may include one of the many cognitive-behavioral curricula on a range of different topics, such as thinking and problem solving, anger management, stress management, or job-seeking skill development.

Treatment should focus on revising criminal thinking, attitudes, and behaviors and be matched to the offender's characteristics and the therapist's experience, training, and program goals. Remember that the primary goal of offender treatment is to motivate offenders to participate while providing the optimal environment for them to acquire prosocial behaviors (thoughts, attitudes, and emotions).

A program should also include ongoing substance abuse treatment assistance and aftercare subsequent to completion of the primary phase of treatment.

Frequently, the initial components of program design and implementation are conducted under the auspices of a federal, state, or county grant or cooperative agreement. Design and fidelity of implementation of an effective program are key to how long a program or project can be sustained—and ultimately determine the integrity of client outcomes.

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violence has affected their lives. For some, the experience brought tears; for others, a chance to tell their story; but for all, it was a transforming experience.

Milwaukee, Wisconsin has become one of the most violent cities in the nation: Shootings have grown exponentially in the last two years; the homicide count has grown each year for three years; and the rate of poverty continues to skyrocket. Wisconsin has one of the highest incarceration rates for African-American males, and the prisons, as in other locales, are seriously overcrowded. Our traditional system of retributive justice will continue the black hole of incarceration, as one generation grows into the next. Locking everyone up and throwing away the key is no longer a viable alternative.

While the most violent and severe offenders must be incarcerated to protect the community, there are those who, within a restorative model of justice, can be helped to lead productive lives back in their communities. This was the rationale for Milwaukee's being one of the eight states in the country to become a pilot project for a U.S. Department of Justice grant to decrease crime through alternative means of law enforcement, community engagement, and some new practices for the state's Department of Corrections.

Based on a model developed by Columbia University's Dr. David Kennedy, the Safe Streets project is a community-wide effort engaging city leaders and institutions in ways that have never before been achieved. In 2007, flowing from a "Common Ground" conference led by the Mayor of Milwaukee, the Deputy U.S. Attorney brought together myriad leaders to propose a project that would have three main components:

- Enhanced and nontraditional resources for members of law enforcement;
- Staff to engage with and create stronger connections in the community; and
- Different operational practices for corrections at the state level and in the community.

The project focuses on two areas of the city: the near north side (Milwaukee Police District 5), a chiefly African-American community, burdened with poverty, an unemployment rate of more than 60%, and the city's highest rate of violent crime; and the near south side (Milwaukee Police District 2), a largely Latino area, with high rates of poverty, drug abuse, illegal guns, and gang warfare.

Benefits of the Restorative Justice Talking Circle

Marquette University Law School's Restorative Justice Initiative submitted a

proposal to lead the community engagement section and delineated a restorative justice model for achieving new outcomes. Restorative justice is a philosophy that is victim driven and seeks to place the harm that results from offenders' actions in the middle of the equation. Traditional justice practices are offender focused: Nearly all resources, time, and effort are spent on the offender—arresting, charging, investigating, prosecuting, convicting, sentencing, and incarcerating. The only time that a victim is brought into the equation is to testify against the offender. By contrast, restorative justice allows the victim a voice and focuses on the widespread harm that has been done by offenders. There are several models of restorative justice, including:

- Victim-offender dialogue;
- Community conferencing; and
- Native American talking circles (the model which we address here).

Since May, 2007, while law enforcement has been conducting intensive surveillance, research, and planning for gang "take downs" and "call-ins," Marquette's community coordinators in each district have been developing relationships, strengthening community ties, and holding talking circles for a variety of constituencies. The experience of these has

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