DOWNLOAD PDF THE USE OF METHYLPHENIDATE AND ATS IN THE TREATMENT OF ADHD CRAIG RUSH . [ET AL.]

Chapter 1 : Ritalin vs Concerta - calendrierdelascience.com

Methylphenidate is commonly prescribed and effective for the treatment of attention deficit/hyperactivity disorder (ADHD) symptoms in children and adults (Brown et al. ; Faraone et al. ; Spencer et al.). ADHD is characterized by abnormal levels of impulsivity, inattention, and hyperactivity, the primary cause for which is not fully.

Chronic abuse can manifest itself as psychosis, often indistinguishable from schizophrenia What to Do About Side Effects The last dose of the drug every day should be taken several hours before bedtime to prevent insomnia. Nervousness usually goes away and appetite often returns so that weight loss is rarely dangerous. If high blood pressure, rapid pulse, paranoia, or tolerance becomes a problem, the drug is usually stopped. Nothing can be done about the addiction except to remember not to stop taking any version of methylphenidate abruptly. The use of clonidine and methylphenidate in combination continues to be controversial. Both drugs can adversely affect an irregular heart rate or rhythm cardiac arrhythmia and this effect can be worsened when the drugs are combined. Four deaths of children using both drugs were reported to the FDA. Methylphenidate drugs are Schedule II Substances, which means methylphenidate drugs have a "high potential for abuse" that "may lead to severe psychological or physical dependence," and the federal government sets limits on the amount of methylphenidate drugs that may be manufactured each year. Dependence, Tolerance and Withdrawal It is possible to build up a tolerance to Methylin, which means the person using the drug needs to take larger doses to achieve the same effect. Over time, the body might come to depend on methylphenidate drugs just to function normally. The person craves the drug and their psychological dependence makes them panic if access is denied, even temporarily. Withdrawal symptoms can include tiredness, panic attacks, crankiness, extreme hunger, depression and nightmares. Some people experience a pattern of "binge crash" characterized by using continuously for several days without sleep, followed by a period of heavy sleeping. Withdrawal symptoms are psychological and stopping suddenly can cause extreme fatigue and severe, even suicidal, depression in adult patients. Abrupt cessation of stimulant drugs such as methylphenidate drugs can cause extreme fatigue and severe, even suicidal, depression in adult patients. If It Does Work "Also, in addition to increasing heart rate and blood pressure, causing insomnia and weight loss, and sometimes causing psychotic symptoms, the stimulant medications used for ADHD methylphenidate drugs and amphetamines may cause heart disease if taken for a long time. The latter problem led to a debate within the FDA, well covered by newspapers, about whether to issue a special warning to doctors. A review of years of scientific literature on using stimulant medications, including methylphenidate drugs, to treat children with ADD and ADHD found a consensus: Methylin Medication Guide, rev. Washington, DC, , as cited above. The Case Against the Drug Companies: Avon Books and St. The Complete Guide to Psychiatric Drugs: Straight Talk for Best Results, Rev. Ritalin Free Kids; California: Prima Health, Prima Publishing Long-Term Effects of Methylin: Changes in Brain Development Ongoing research shows early-life use of Methylin methylphenidate has complex effects that endure later into life. A study published in Biological Psychiatry suggests that exposure of methylphenidate in youth may later disrupt development of brain cells in the hippocampus, region of the brain critical to memory, spatial navigation, and behavioral inhibition. Damage can lead to memory problems, disorientation and depression in adulthood.

Chapter 2 : Methylin Side Effects and Warnings

Craig Rush, Et Al. "Behavioral Pharmacological Similarities Between Methylphenidate and Cocaine in Cocaine Abusers." Experimental and Clinical Psychopharmacology. 9(1), Feb ,

As a central nervous system stimulant, it is used as a treatment method for ADHD and narcolepsy. Methylphenidate affects specific chemicals and nerves in the brain that are associated with hyperactivity and impulse control. Methylphenidate should be part of larger treatment plan which can include cognitive behavioral therapy. Ritalin Addiction Ritalin abuse is common with teens and young adults using it to the point they become addicted. Ritalin is a type of amphetamine drug and is related to the highly addictive crystal meth. What is making Ritalin such a problem is its availability. Young people can find it in school, in their homes, and it can also be bought online illegally. Ritalin is also addictive for those who already suffer from stimulant addictions like cocaine or meth. When someone is given a prescription, Ritalin dosage is suggested and it should be adhered to. When users just take Ritalin for the high, they can create a tolerance that gets out of control. It is within the misuse of Ritalin that people are becoming addicted. This creates a sensation much different than when used properly. When someone abuses Ritalin, it can cause a psychological or physical dependence. The Ritalin dosage can increase due to tolerance and cravings may ensue. If you notice that someone you care about is abusing Ritalin, there are professional services to help with prescription drug addiction. To obtain a greater high, users will often snort Ritalin which causes irregular heartrate, hallucinations, and seizures. Methylphenidate is similar to amphetamine drugs which helps a person with ADHD to concentrate. When taken by people abusing the drug for a high, it can cause agitation and restlessness. Ritalin and its euphoric effects are attributed to the fact it increases dopamine in the brain. This is why people enjoy the high which makes them feel happy and gives them a sense of well-being. If you notice someone using Ritalin as a party drug or consistently using it to get high, they may need help to stop using Ritalin. There are college students abusing Ritalin that they were prescribed when they were younger. It becomes useful in college but some will also mix it with alcohol and snort it for a greater high. Serious abusers of Ritalin will binge-crash. This is where they take high Ritalin dosages for a few days and not sleep. This results in a coma-like state once they stop taking Ritalin. They may sleep heavily for long periods of time after a binge session. It mimics cocaine abuse and builds up a tolerance for Ritalin. Within this binge frame, they are more likely to snort Ritalin to get a greater high and feeling of euphoria. The severity of this kind of abuse can lead to coma, heart problems, and death. If someone you know is abusing Ritalin, it may be time to get them some professional addiction treatment. Ritalin Side Effects When someone abuses Ritalin, it increases the side effects that come with the drug. Some side effects are quite serious and should be monitored by a doctor. Ritalin can change how the heart beats and interfere with breathing. The active drug in Ritalin, methylphenidate, can affect growth in children. Some of the common side effects of Ritalin include; A pain in the chest. A fast, pounding heartbeat that can be irregular. Changes in mood such as agitation, excitement, or depression. Paranoia, hallucinations, or delusions may occur.

Chapter 3 : Methylphenidate increases cigarette smoking in participants with ADHD

The iSPOT-A is a Phase IV, multi-site, international, open-label effectiveness trial that aims to identify (a) characteristics that differentiate ADHD compared with healthy controls and (b) objective biological and cognitive markers that best predict treatment response to MPH.

This article has been cited by other articles in PMC. Abstract Transdermal technology is currently approved in the US for the administration of more than 20 medications. This current review describes the clinical research pertaining to the use of a methylphenidate patch in the treatment of attention-deficit hyperactivity disorder ADHD in children and adolescents. No limits were set for dates of publication. A total of 21 citations were identified. Studies evaluating the safety and efficacy of the methylphenidate transdermal system MTS in children and adolescents were included in this review. The MTS delivers a range of methylphenidate doses using a drug-in-adhesive matrix patch. Adverse events with the MTS are similar to those seen with other formulations of methylphenidate, with the exception of skin-related reactions at the site of application, which were generally mild to moderate in severity. Statistically significant improvements in health-related quality of life and medication satisfaction were also observed with the MTS compared with placebo, and after switching from oral extended-release ER methylphenidate. Transdermal drug delivery is an effective and safe means of administering methylphenidate for patients with ADHD. Overview of Transdermal Technology Currently, there are more than 20 medications available in the US that use generic and branded transdermal systems [1]. These include patch products for smoking cessation, antihypertensives, pain relievers, anti-nausea medications, and hormone therapies. Potential Advantages of Transdermal Delivery In an effort to improve adherence to treatment, individualizing therapy is a growing trend in the management of chronic conditions. The development of transdermal systems has facilitated individualizing the duration of therapy for patients because a patch can be removed, stopping the delivery of medication, unlike orally administered medications which remain in the system once ingested. Transdermal absorption minimizes first-pass metabolism, hepatic side-effects, the attendant potential for drugâ€”drug interactions, as well as the risk of gastrointestinal irritation may be reduced [1]. Steady absorption of drug through the skin may provide more consistent drug exposure during dosing and might avoid serum drug peaks and troughs [5]. This reduction of peaks and troughs may, in turn, decrease the incidence of adverse effects [1]. Long-acting LA transdermal patches often require less frequent dosing, which may also help improve adherence to treatment [6 , 7]. Although there are few data regarding children and adolescents, patch technology does appear to improve adherence to treatment in a range of patient populations [6 â€” 8]. In one trial of a contraceptive patch, excellent adherence and no pregnancies among adolescent patients were reported [8]. Patients cited once-daily dosing as a key factor in their adherence. Caregivers preferred the dosing schedule, ease of use with the patch over oral administration, and reported greater overall satisfaction and less interference with daily life when using the patch. Potential Limitations of Transdermal Delivery Of course, these possible benefits must be weighed against potential disadvantages. For some drugs, transdermal delivery is associated with a delayed onset of action compared with oral and parenteral administration [1]. Absorption of drug can be compromised if the patch does not properly remain in contact with the skin. Some patients develop irritant or allergic contact dermatitis leading to the discontinuation of treatment [1]. Skin irritation may result from exposure to the drug being administered or the structural components of the patch. Irritant contact dermatitis is the most common type of dermal reaction seen at patch application sites, and it is an inflammatory response localized to the site and characterized by erythema, but it may also be itchy and edematous. However, irritant contact dermatitis usually resolves without treatment after removal of the irritant [11]. Removal of the patch itself may cause transient erythema alone or may be accompanied by flare and edema triple response of Lewis [11]. Types of Patches Transdermal administration is used to deliver drugs locally e. Passive transdermal drug delivery systems may be categorized as either reservoir or matrix designs. In the former, the drug is stored in one or

more reservoirs located between the backing of the patch and a membrane that is engineered to control the rate of diffusion into the skin [1]. In the matrix design, the drug is embedded either in the adhesive drug-in-adhesive patches , or in a layer of matrix material between the adhesive layer and the backing. The total amount of drug delivered is related to the rate of drug delivery from the matrix, as well as being proportional to the surface area of the patch that is in contact with the skin and the duration of application. With both passive designs, once the patch is applied to the skin, a diffusion gradient is established, and the drug moves into the stratum corneum, the outer layer of the skin Fig. Transit through the stratum corneum is carried out by diffusion through intercellular lipids [12]; this is the rate-limiting step in passive transdermal drug delivery [1]. Patches are typically designed such that residual drug concentrations in the patch are low when they are applied for the recommended duration of wear time.

Chapter 4 : Ritalin (Methylphenidate) and the Abuse/Addiction Risks

Methylphenidate is clearly effective for the treatment of ADHD, but there is controversy as to whether it has significant abuse potential like other psychostimulants (e.g., D-amphetamine and cocaine).

The following article addresses a powerful drug. I do not condone the use of methylphenidates or any drugs by anyone under 18 or anyone at any age for that matter. The class of drugs known as methylphenidates include such brand names as Concerta, Tranquilin European version , Focalin dexmethylphenidate HCl and perhaps most famously: Increased heart rate and blood pressure with accompanying vasoconstriction, increased sweating, paranoid delusions, high body temperature hyperthermia , and of course, addiction. However the list goes on 1,5. All of the above symptoms of overdose are also side effects of the drugs, to a much lesser degree of course. Many of these side effects are actually desired effects for many. Over the last 20 years or so, Ritalin has gained popularity as a performance enhancer for everyone from computer programmers to power-lifters. Ritalin takes effect in about minutes, and hits peak plasma levels roughly five hours after the initial dose. It is supplied in 5, 10, and 20 mg. The daily-dosing for adults ranges from as little as 10mg. Clinically, Ritalin is only administered orally. Recreational use is another story. ER doctors have seen too many cases of both lethal overdoses and stimulant-based psychosis from IV Ritalin use 5. If I may editorialize for a moment, it is a very, very bad idea to shoot Ritalin. With all the warnings out of the way finally we can get down to brass tacks and what you really want to know: About this time in I was a sophomore at some shit-bag high school in NJ. Baseball tryouts had just started. Not only were he and I the only two sophomores to make the Varsity team, we were the only ones to do it in six years, and start from time to time. In the locker room, John was exposed daily to the sounds of horse grunts: Me on the other hand, I flew under the radar. I had a revelation after that first tryout on Ritalin. I was in the zone, heavily whenever it was racing through my veins. And no one had a clue. As it turns out, five years earlier a group of researchers had stumbled, quite deliberately onto the same thing. Concentrate, Young Grasshopperâ€¦ In a double blind, placebo-controlled crossover study, 17 ADHD boys were studied during a baseball game while on methylphenidate therapy. The conclusion found that the drug had a beneficial effect during the game 4,. Keep in mind, this study was done on children, ages , with ADHD! Imagine the results if a similar study was conducted on amateur, college or even high-school ball players. Not so for every sport. Most sprinters and distance runners would prefer modanafil Provigil to either Ritalin or any amphetamine. Ritalin is a very sport-specific drug. An endurance-athlete would most likely prefer modanafil because of all the psychomotor or CNS stimulants, it raises heart rate and blood pressure the least. Ritalin however, is almost tailor-made for sports that acquire only occasional or light physical exertion, such as: Ah yes, but this is a bodybuilding board, so: What can Ritalin do for you? Trying to Make Weight? One study documented that a daily dose of 30mg. The book did note however, the potential dangers of using CNS stimulants as weight-loss aids in overweight children. To the untrained individual, be it a hyperactive child or a sedentary adult, Ritalin probably has the potential to eat away just as much if not more muscle as fat. However you are a trained athlete: Ritalin can be a valuable weapon to have in your arsenal. Save the more potent drugs that actually burn fat or keep your hormones balanced for later. Of course Ritalin may burn fat on its own too. So What Have We Learned? Ritalin will make you forget to eat: However it will also jack up your cardiac output so all you tri-athletes may want to avoid it. If abused hard enough, it has the ability to make you certifiably insane for a day or two. There are also links to serious cardiovascular problems, including an increased risk of sudden death and heart attacks. The key with Ritalin, as with every compound and even life in general, is moderation. Then again, so does the choice to pass on it altogether. Online 21 February, Available: Craig Rush, Et Al. O nline, 22 February, Practical advice and clinical guidance for successful collaboration. American Psychological Association , Vol. Put Special Warning Labels on Ritalin.

Chapter 5 : ADHD and Addiction | Specialised Rehab Therapy | Castle Craig

Methylphenidate drugs are Schedule II Substances, which means methylphenidate drugs have a "high potential for abuse" that "may lead to severe psychological or physical dependence," and the federal government sets limits on the amount of methylphenidate drugs that may be manufactured each year.

Popular slang terms for prescription stimulants include Speed, Uppers, and Vitamin R. Some people take prescription stimulants to try to improve mental performance. Teens and college students sometimes misuse them to try to get better grades, and older adults misuse them to try to improve their memory. Taking prescription stimulants for reasons other than treating ADHD or narcolepsy could lead to harmful health effects, such as addiction, heart problems, or psychosis. How do people use and misuse prescription stimulants? Most prescription stimulants come in tablet, capsule, or liquid form, which a person takes by mouth. Misuse of a prescription stimulant means: Alternatively, they can crush tablets or open the capsules, dissolve the powder in water, and inject the liquid into a vein. Some can also snort or smoke the powder. How do prescription stimulants affect the brain and body? Dopamine is involved in the reinforcement of rewarding behaviors. Norepinephrine affects blood vessels, blood pressure and heart rate, blood sugar, and breathing. Short-Term Effects People who use prescription stimulants report feeling a "rush" euphoria along with the following: What are the other health effects of prescription stimulants? Repeated misuse of prescription stimulants, even within a short period, can cause psychosis, anger, or paranoia. If the drug is injected, it is important to note that sharing drug injection equipment and having impaired judgment from drug misuse can increase the risk of contracting infectious diseases such as HIV and hepatitis. Can a person overdose on prescription stimulants? Yes, a person can overdose on prescription stimulants. An overdose occurs when the person uses enough of the drug to produce a life-threatening reaction or death read more on our Intentional vs. Unintentional Overdose Deaths webpage. When people overdose on a prescription stimulant, they most commonly experience several different symptoms, including restlessness, tremors, overactive reflexes, rapid breathing, confusion, aggression, hallucinations, panic states, abnormally increased fever, muscle pains and weakness. They also may have heart problems, including an irregular heartbeat leading to a heart attack, nerve problems that can lead to a seizure, abnormally high or low blood pressure, and circulation failure. Stomach issues may include nausea, vomiting, diarrhea, and abdominal cramps. In addition, an overdose can result in convulsions, coma, and fatal poisoning. How can a prescription stimulant overdose be treated? Because prescription stimulant overdose often leads to a heart attack or seizure, the most important step to take is to call so a person who has overdosed can receive immediate medical attention. First responders and emergency room doctors try to treat the overdose with the intent of restoring blood flow to the heart and stopping the seizure with care or with medications if necessary. Can prescription stimulant use lead to substance use disorder and addiction? Yes, misuse of prescription stimulants can lead to a substance use disorder SUD , which takes the form of addiction in severe cases. An SUD develops when continued use of the drug causes issues, such as health problems and failure to meet responsibilities at work, school, or home. Concerns about use should be discussed with a health care provider. If a person develops an SUD and stops use of the prescription stimulant, he or she can experience withdrawal. Withdrawal symptoms can include:

Chapter 6 : Chemically Correct: Methylphenidate by Victor Lasato

Methylphenidate is approved by the FDA for treatment of ADHD. Medical use of methylphenidate began in the 's. It wasn't until the 's that there was an increase in prescriptions due to the diagnosis of ADHD as a true disorder.

Ritalin Addiction and Treatment Options Withdrawal from Methylphenidate The psychoactive ingredient in Ritalin is methylphenidate , which is a stimulant drug that is also found in a number of other medications, including Concerta. These drugs are primarily used for the treatment of attention deficit hyperactivity disorder ADHD , the sleep disorder narcolepsy, and as mild stimulants for other conditions that may have a side effect of producing lethargy e. Schedule II substances are considered to be drugs that have potential medicinal uses, but are also potentially drugs of abuse and most likely produce significant physical or psychological dependence in individuals who take them. The development of physical dependence on Ritalin is associated with the development of both tolerance and withdrawal symptoms that are mentioned by a number of other sources outside of the DEA; however, the actual identification of a formal withdrawal syndrome associated with Ritalin is less well identified. Withdrawal There are a number of factors that will influence the withdrawal syndrome or discontinuation syndrome associated with the use or abuse of Ritalin. The most salient factors are outlined below. The short half-life of the drug which on average is about 2. Individuals who take therapeutic doses of Ritalin will have metabolized the drug within 24 hours after discontinuation; individuals taking extremely high doses will take longer to do so. For individuals abusing the drug, the typical doses taken on a regular basis will influence the withdrawal process as well as the length of time the individual was abusing the drug. Stopping the drug suddenly compared to slowly cutting down the dosage will also affect the onset of withdrawal symptoms and their duration. Individuals have different variations in metabolism, and this will result in individual variations in the onset of withdrawal symptoms and their duration. In addition, individual differences in psychological makeup will also affect the withdrawal process. The literature lists a number of potential symptoms that can occur during withdrawal from Ritalin. Is important to note that most individuals will not experience all the symptoms. In fact, most individuals will only experience a few of them. The longer one took the drug, the higher amount of the drug that one typically took, and other factors will affect the specific withdrawal process. The symptoms that are most commonly listed in the literature include: Issues with mood or mood swings: Because methylphenidate primarily affects the neurotransmitters dopamine and norepinephrine by increasing their availability in the central nervous system, once an individual discontinues the drug, there is a depletion of these neurotransmitters. Some individuals may experience issues with anxiety and, in rare cases, delusions or hallucinations. Lethargy, fatigue, and extreme tiredness: Many individuals will experience an increased need to get sleep following discontinuation of Ritalin. An increase in appetite: Some individuals may gain weight after they discontinue Ritalin. Some individuals may experience achiness or cramping in the muscles. Headaches, mild tremors, nausea, and general feelings of illness may be present. Autonomic nervous system symptoms: These can include increased heart rate, increased blood pressure, fever, chills, sweating, and overall jitteriness. Relapse may occur due to a desire to use the drug again to get rid of withdrawal symptoms. The actual timeline that occurs when an individual is withdrawing from Ritalin is not well defined, and it is most likely quite variable from individual to individual. In addition, the withdrawal process is most likely not very lengthy. A number of research studies looking at the effects of discontinuing methylphenidate indicate that very short withdrawal periods are expected. Individuals who binge on methylphenidate or Ritalin could conceivably have significantly longer withdrawal periods from the drug. If they habitually mix Ritalin with other drugs of abuse, such as alcohol, the withdrawal syndrome for these individuals can be significantly more complicated. In general, the timeline for withdrawal from Ritalin can be hypothesized to occur over the following course: Withdrawal symptoms would be expected to occur within hours after one stops using the drug. Initial symptoms would primarily consist of issues with mood, fatigue, and increased appetite. Cravings for the drug

can also begin to surface once the individual begins to experience issues with mood and lethargy. Symptoms should peak within hours, and there may be a number of other symptoms that occur, including fever, chills, mild sweating, mild tremors, issues with concentration, and cravings. Within the first week, individuals will most likely still be experiencing issues with mood, increased appetite, and an increased need for sleep. However, individuals who used Ritalin for the therapeutic control of ADHD may experience a rebound effect, which is the return of symptoms that the medication initially controlled. Following a week after discontinuation, individuals may still experience mild issues with fatigue, increased appetite, depression, and attention; however, these should be relatively mild compared to the acute phase of withdrawal. Reports of a so-called post-acute withdrawal syndrome reflect a number of different psychological and even physiological mechanisms that are most likely not related to a continuing withdrawal process from the drug. Post-acute withdrawal syndrome has never been recognized as a formal withdrawal syndrome by a major medical association, such as the American Psychiatric Association APA. APA does recognize a formal withdrawal syndrome from stimulant medications like Ritalin in its diagnostic criteria; however, it does not recognize post-acute withdrawal syndrome for any substance of abuse. This certainly does not mean that individuals who are recovering from substance use disorders do not often struggle with intermittent issues regarding cravings, depression, motivation, etc. What it does mean is that these symptoms do not appear to be directly associated with the withdrawal process from the drug and are more likely associated with more deep-rooted psychological and physiological mechanisms. The withdrawal syndrome associated with stimulant medications is often reported to be primarily consisting of psychological symptoms. These psychological symptoms result from actual physiological mechanisms that taking and discontinuing the drug produce. It should also be understood that individuals who abuse Ritalin often use extremely high amounts of the drug and mix it with other drugs. Individuals who have abused Ritalin for a significant length of time are more likely to display atypical withdrawal syndromes and much more lengthy periods of withdrawal than individuals who use it medicinally under the supervision of a physician. The withdrawal process from Ritalin is not normally considered to be potentially dangerous or fatal in the same way that withdrawal from alcohol may produce severe seizures. However, in some cases, individuals who mix Ritalin with other drugs e. Anyone who is undergoing a discontinuation syndrome from any drug is at risk for harm due to potential accidents, lapses in judgment that are related to the effects of the withdrawal process, and stress or potential self-harm due to suicidal thoughts that may occur in some individuals. People are also susceptible to relapse during the withdrawal process. Individuals who attempt to discontinue Ritalin either from prescribed medicinal use or from abuse should seriously consider consulting with a physician before discontinuing the drug. This is because individuals may experience emotionally distressing issues associated with discontinuing the drug or may be at risk for harm and relapse if they cannot tolerate the withdrawal process. It is highly recommended that individuals discontinuing Ritalin do so under the supervision of a physician and a formal withdrawal management program. Physicians can monitor the individual who is discontinuing Ritalin, administer medications to help the individual to negotiate the distressing symptoms of withdrawal, and address any other co-occurring issues that may complicate the process. Individuals who attempt to withdraw from abuse of Ritalin on their own are at a high risk for relapse and for potential dangerous complications that would not otherwise occur if they were enrolled in a professional withdrawal management program.

Chapter 7 : DrugFacts: Prescription Stimulants | National Institute on Drug Abuse (NIDA)

Although stimulants have been in use for decades to treat ADHD in school-aged children, just how they work hasn't been clear. But the results of a new study in the Journal of Child Psychology and.

The results of previous studies suggest that methylphenidate increases cigarette smoking in participants without psychiatric diagnoses. Whether methylphenidate increases cigarette smoking in participants diagnosed with ADHD is unknown. Objective In this within-subjects, repeated measures experiment, the acute effects of a range of doses of methylphenidate 10, 20, and 40 mg and placebo were assessed in nine cigarette smokers who were not attempting to quit and met diagnostic criteria for ADHD but no other Axis I psychiatric disorders other than nicotine dependence. Methods Each dose of methylphenidate was tested once while placebo was tested twice. One hour after ingesting drug, participants were allowed to smoke ad libitum for 4 h. Measures of smoking included total cigarettes smoked, total puffs, and carbon monoxide levels. Snacks and decaffeinated drinks were available ad libitum; caloric intake during the 4-h smoking session was calculated. Results Methylphenidate increased the total number of cigarettes smoked, total number of puffs, and carbon monoxide levels. Methylphenidate decreased the number of food items consumed and caloric intake. Conclusions The results of this experiment suggest that acutely administered methylphenidate increases cigarette smoking in participants with ADHD, which is concordant with findings from previous studies that tested healthy young adults. These data indicate that clinicians may need to consider non-stimulant options or counsel their patients before starting methylphenidate when managing ADHD-diagnosed individuals who smoke. ADHD is characterized by abnormal levels of impulsivity, inattention, and hyperactivity, the primary cause for which is not fully understood. Methylphenidate is a central nervous system stimulant that blocks the dopamine transporter, preventing the reuptake of dopamine, resulting in increased extracellular dopamine. Results of previous studies from our laboratory demonstrate that methylphenidate, regardless of formulation type i. In those studies, participants were administered sustained or immediate-release methylphenidate and were allowed to smoke ad libitum for 4 h during the peak effects of the medication. Sessions were videotaped and scored for various smoking behaviors. In all studies, at least one dose of methylphenidate increased the total number of puffs significantly compared to placebo Rush et al. In another study from our laboratory, methylphenidate was shown to increase the choice of cigarettes over money Stoops et al. Methylphenidate increased choice of cigarettes over money, suggesting that methylphenidate increases the reinforcing efficacy of cigarettes. Results of several other human laboratory studies suggest that d-amphetamine, a psychostimulant medication also used to treat ADHD, increases cigarette smoking when administered acutely Cousins et al. Taken together, results of these studies demonstrate a clear relationship between the acute effects of stimulant drugs and increased cigarette smoking behavior in non-ADHD adult cigarette smokers. Individuals with ADHD are at increased risk to smoke relative to individuals without psychiatric disorders Lambert and Hartsough ; Molina and Pelham ; Milberger et al. ADHD-diagnosed individuals also initiate smoking earlier and have a greater severity of tobacco abstinence symptoms and greater difficulty quitting than people without psychiatric disorders Pomerleau et al. The reason for the increased prevalence and severity of smoking and nicotine dependence in persons with ADHD is unknown. Some researchers have speculated that individuals with ADHD self-medicate by abusing stimulant-like drugs such as nicotine in order to enhance attention or reduce symptoms of ADHD Gehricke et al. Consistent with that notion, the nicotine patch and nicotinic agonists have been shown to ameliorate some ADHD symptoms Gehricke et al. This hypothesis would indicate that smoking would be reduced in individuals with ADHD whose symptoms were properly controlled through treatment with psychostimulants such as methylphenidate Winhusen et al. Other researchers have suggested that treatment with psychostimulants may actually increase the risk of later tobacco smoking dependence Lambert and Hartsough ; Lambert To the best of our knowledge, the direct effects of methylphenidate on cigarette smoking have not been examined in adults with ADHD. The purpose

of the current investigation was to determine the acute effects of methylphenidate 0, 10, 20, and 40 mg on cigarette smoking behavior in ADHD-diagnosed, non-medicated daily cigarette smokers. Nine otherwise healthy adults participated in this study. Outcome measures included number of cigarettes, total puffs, expired air carbon monoxide, caloric intake, cardiovascular indices, and subjective effects. Caloric intake was included as a secondary measure of the effects of methylphenidate on consumptive behavior and to highlight the specificity of the effect of methylphenidate on cigarette smoking behavior. We hypothesized that acute methylphenidate administration would increase smoking and decrease caloric intake in these non-medicated ADHD-diagnosed participants. Methods Participants Nine adult cigarette smokers four males, five females who met diagnostic criteria for ADHD were recruited via newspaper ads, flyers, and word-of-mouth to participate in this experiment. In order to be included, participants had to: Participants enrolled as outpatients at the Laboratory of Human Behavioral Pharmacology at the University of Kentucky Medical Center Monday through Friday for six experimental sessions. Participants were informed that, during their participation, they would receive various drugs and these could include placebo and medications indicated for ADHD. Participants were told that the purpose of the study was to see how these drugs affect mood and behavior. No medications were administered during practice sessions. Participants were requested to refrain from using all illicit psychoactive drugs throughout the study, caffeine and solid food for 4 h prior to a scheduled experimental session, and alcohol for 12 h prior to a scheduled experimental session. On each experimental session day, participants arrived at the laboratory and had to provide a urine sample negative for amphetamine, barbiturates, benzodiazepines, cocaine, and opioids in order to begin session OnTrak Teststik, Varian Inc. Participants also provided an expired air specimen, which had to be negative for the presence of alcohol using a handheld breathalyzer Alco-Sensor, Intoximeters, Inc. Louis, MO and pass a standard field sobriety test. Participants generally arrived at the Laboratory of Human Behavioral Pharmacology at hours. Participants were instructed to abstain from smoking for at least 4 h before arriving at the Laboratory of Human Behavioral Pharmacology. Immediately after arriving, participants provided an expired breath sample that was used to determine their carbon monoxide level using a handheld carbon monoxide meter Smokerlyzer, Bedfont Scientific, Medford, NJ. If an acceptable carbon monoxide level could not be obtained within 1 h of arrival, the experimental session was canceled and rescheduled. After meeting the carbon monoxide criterion, generally between and hours, participants were allowed to smoke one cigarette of their preferred brand in order to reduce the possibility of testing the effects of methylphenidate during acute nicotine withdrawal. Between and hours, participants were provided a standard low-fat breakfast. At approximately hours, participants completed the drug-effect questionnaires. Between and hours, participants were alone in the experimental testing room, but they were not allowed to smoke. During this time, participants were allowed to engage in sedentary recreational activities e. Experimental medications were administered at hours. At hours, participants were provided with a pack of their preferred brand of cigarettes and an assortment of snacks and decaffeinated drinks. Subject-rated drug-effect questionnaires and carbon monoxide and physiological measures were completed at regular intervals following drug administration see below. During each session, participants remained seated in the lounge chair. Outcome measures used to assess smoking included total puffs per session, exhaled carbon monoxide see physiological measures below , and total cigarettes smoked per session. All experimental sessions were digitally recorded. All smoking within each session was double scored from a digital recording by a primary and a secondary observer, both of whom were blind to the dose conditions. Dividing the number of agreements between observers by the number of possible agreements and multiplying by determined the interobserver reliability Interobserver Reliability Food intake Food and beverage intake following drug administration was measured to further characterize the behavioral effects of methylphenidate in ADHD-diagnosed adults. An assortment of food items and decaffeinated beverages, which were individually selected by participants based upon their preference, were available ad libitum during each experimental session. The available food items and beverages remained the same across all experimental sessions for each participant. Both the number of items consumed and the total caloric intake were determined.

The number of items consumed was calculated at the end of each experimental session by counting the number of food packages and beverage containers opened by the volunteer. To calculate caloric intake, the available food items and beverages were weighed prior to being served. At the end of the session, if a food item or beverage was not completely consumed, it was reweighed, and the proportion consumed was multiplied by the caloric content of the entire food item. If a food or beverage item was completely consumed, the caloric content for the entire item was recorded. The number of calories consumed for each food item and beverage was then summed to calculate the total caloric intake for the experimental session. Subject-rated drug-effect questionnaires Subject-rated drug-effect questionnaires were administered on a computer or completed using paper-and-pencil forms. The subject-rated drug-effect questionnaires were completed in fixed order. Subject-rated drug-effect questionnaires included a locally developed drug-effect questionnaire that contains 20 items rated on a likert-type scale zero [not at all] to four [extremely] and an adjective rating scale that contains two subscales: These questionnaires were completed approximately 30 min before drug administration and 1, 2, 3, 4, and 5 h after drug administration. Approximately 5 h after drug administration, participants completed a five-item cigarette rating scale as well as a five-item food rating scale. The items rated were: Participants responded to these questions using five options: Scores from each item were summed to create a total score. Physiological measures Blood pressure and heart rate were recorded using an automated blood pressure monitor. Blood pressure and heart rate were monitored for approximately 30 min before drug administration and 0. Expired carbon monoxide was measured 30 min before drug administration and 1, 2, 3, 4, and 5 h after drug administration. When measured at the same time point, physiological measures were recorded immediately before participants completed the subject-rated drug-effect questionnaires. Drug administration The drug conditions were placebo, 10, 20, and 40 mg methylphenidate. Therefore, the doses of methylphenidate selected for the current study are within the therapeutic range. Each active dose of methylphenidate was tested once, while placebo was tested twice. Doses were administered in mixed order with the exception that the highest dose was never administered during the first experimental session. All dose conditions were administered in a double-blind fashion. Commercially available drug 10 mg, methylphenidate, CelTech, Rochester, NY was over-encapsulated in a size zero capsule to prepare the doses. Cornstarch was used to fill the remainder of these capsules. Placebo capsules contained only cornstarch. During each experimental session participants ingested four capsules. Administering the appropriate number of active and placebo capsules varied dose. Capsules were taken orally with approximately ml of water. Drug administration procedures were designed to ensure that participants swallowed the capsules. To accomplish this, the research assistant: At least 24 h separated all drug administrations. Data analysis One-tailed t tests Statview, Cary, NC were used to compare data from each of the active dose conditions to the average from the placebo conditions. Data were analyzed statistically as raw scores for most measures, with the exception that data from the placebo sessions were averaged. For carbon monoxide levels, change from baseline was calculated and averaged across the 4-h smoking period.

Chapter 8 : Withdrawal from Methylphenidate - San Diego Addiction Treatment Center

Objective: To explore the utility of cognitive measures for predicting response of children and adolescents to methylphenidate (MPH).Method: Participants from the International Study to Predict Optimized Treatment-in ADHD (iSPOT-A) completed a cognitive test battery prior to receiving 6 weeks of MPH.