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Medication Assisted Treatment for Opioid Use Disorder

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Medication Assisted Treatment for Opioid Use Disorder

By

Michael Anderson

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Abstract

A 22-year-old female with a lengthy history of trauma, polysubstance abuse, and criminal activity; beginning from a very young age. She is currently in felony drug court and resides in a residential substance-abuse treatment facility. She was referred by her substance-abuse therapist for consideration of medication assisted treatment (MAT) to treat her opioid use disorder.

Medication assisted treatment, for opioid use disorder, involves utilizing one of three medications—methadone, buprenorphine, or naltrexone—in conjunction to psychotherapy and psychosocial supports. Because opioid dependence involves both psychological and physical factors, MAT helps to relieve physical cravings & withdrawal symptoms so the individual can focus on gaining skills to assist them in their recovery (SAMHSA, 2019). Naltrexone (NTX) was chosen for this patient, based upon clinical evidence of efficacy, patient characteristics, and NTX is the preferred medication for this clinic. Although MAT has been available for over 4 decades—in the form of methadone—access to its use remains a large barrier; especially in rural communities with limited resources (Blanco & Volkow, 2019).

Background

This case-study will discuss rational for choosing Naltrexone for MAT of a 22-year-old female, with OUD and other comorbidities, in an outpatient community mental health clinic. This individual began using mind-altering substances from a very young age and has continued to abuse substances throughout her life. She is currently in felony drug court and residing in a residential substance abuse treatment facility. She will soon complete the inpatient portion of her treatment and would likely benefit from medication assisted treatment in conjunction to this change in her level of support.

Medication assisted treatment (MAT) for opioid use disorder includes the use of three medications—methadone, buprenorphine, & naltrexone—in conjunction to psychotherapy and psychosocial supports. Opioid dependence involves both psychological and physical factors; MAT helps to relieve physical cravings & withdrawal symptoms so the individual can focus on gaining skills to assist them in their recovery (SAMHSA, 2019).

Case Report

A 22-year-old female with a lengthy history of trauma, polysubstance abuse, and criminal activity; beginning from a very young age. She is currently in felony drug court and resides in a

residential substance-abuse treatment center managed by Southwest Behavioral Health Center (SBHC); Horizon House (HH). She was referred to the SBHC medical department, by her substance-abuse therapist, for consideration of medication assisted treatment (MAT).

The patient reports first using mind-altering substances—Peyote—at the age of 7; with a friend that stole the Peyote from their native-American parents. She began smoking tobacco at 8, first used EOTH at 9—with her mother & step-father who “thought it was funny”—, began smoking marijuana daily at 11, injecting heroin daily at 14, and methamphetamine—inhalation & IV—at age 16. She also reports using various hallucinogens, MDMA, cocaine, various pills—including prescription opioid pain-pills & benzodiazepines concurrently—, inhalants, cough syrups & other OTC medications. She was consistently in the juvenile justice system since the age of 9; with a total of over 35 charges prior to the age of 18. Her first DUI was at age 18 and she has had multiple drug-related charges as an adult. She was in HH last year, but ran away from the program and was subsequently jailed for 3 months.

She began to obtain services from SBHC at the age of 16. She was referred from the juvenile justice courts, after completing their Observation and Assessment program. At that time, she was seen by Dr. Williams and placed on Zoloft. She subsequently dropped out of services and hasn't returned until last year when she was admitted to HH. She is currently taking Zoloft & Risperdal that is prescribed by her PCP; she reports these medications have been helpful and feels her mood is stable. She first began experiencing symptoms of depression at age 14; which she reports was a very difficult time in her life. She has been hospitalized 3 times for suicidal ideation; at age 14, 16, and 20. She was placed in a residential treatment center at 14, for a period of 9 months, where she received substance-abuse treatment. Her first suicide attempt was at age 14; where she drank bleach and was treated in emergency department for acute kidney

failure. Her second attempt was at age 15; she swallowed 12 “unknown” pills and taped a plastic bag over head; taking the bag off once she began to vomit, but did not tell anyone until later and did not seek medical attention. And her last attempt was at age 20; when she attempted to overdose on heroin after her boyfriend died in a MVA that she was also injured in. She reported a history of seeing “shadows” out of the corner of her eye —especially during periods without sleep—and multiple occasions where she experienced auditory hallucinations; the voices were arguing with each other and/or telling her how to harm herself. She reports periods of up to 3 days of very poor sleep; but denies excessive energy during these times and is tired but unable to fall asleep.

The patient reports that she does not know her biological father; reporting that she was conceived from a “one-night-stand”. Her mother continued to consume EOTH until the 5th month of gestation; when she discovered she was pregnant with the patient. She reports that she was born without complications and met all major developmental milestones. She was first sexually molested at age 4 by a male cousin; this abuse lasted for 2 years. She was again molested at age 7 by a female babysitter; this abuse lasted for one year. She reports both her mother & step-father were alcoholics growing up and she experienced multiple instances of domestic violence in her home; this domestic violence stopped when she was 11 after her step-father was charged for assaulting her mother. The patient required hospitalization at age 15 for a severe kidney infection. At the age of 20, she was also involved in a MVA; where she was ejected from the car and lost consciousness. She denies being diagnosed with TBI, but fractured her back in 15 places. She was transported via Life-Flight to a hospital in Las Vegas; her boyfriend was driving and subsequently died.

The most-recent SASSI-4—completed 2/20/18—indicated a high probability of having substance abuse disorder, including high probability of prescription drug abuse; high validity with a random answering pattern of 0. A *Risk and Needs Triage* (RANT) report indicated high risk-high needs. She anticipates completing the HH program within 2 weeks and will be discharged. She currently plans to stay at the “Care & Share” homeless shelter upon leaving HH.

Literature Review

Opioids have been used for their medical properties of analgesia for thousands of years, but they have also had a long-history of misuse related to their psychoactive effects. The primary effects of opioids are mediated by the opioid receptors in the human brain, GI tract, and spinal cord. There are 3 main types of opioid receptors—mu, kappa, and delta—and each receptor is identified with specific reactions in the body; including, analgesia, respiratory depressions, constipation, sedation, and dependence. The body produces endogenous opioid molecules called endorphins, dynorphins, & enkephalins—the term “endorphin” is a mash-up of both endogenous & morphine—that is naturally released; for instance, when a person is under stress, exercising, or experiencing pain. Endogenous opioids can help relieve pain, reduce stress, and provide a sense of well-being. This is in-part because they initiate the body’s reward system, by activating the ventral tegmental dopaminergic neurons that project to the cerebral cortex & limbic system. There are also exogenous opioids that act on the same receptors as those affected by endogenous molecules and thus have a similar reaction in the body; including the activation of the internal reward system (Sadock, Sadock, & Ruiz, 2017). Exogenous opioids include

natural, semi-synthetic, and synthetic formulations. Examples of natural formulations include morphine & codeine. Semi-synthetic formulations include heroin & buprenorphine. Synthetic formulations include methadone, fentanyl, & fentanyl analogs (McCarty, Priest, & Korthuis, 2018).

Opioid dependence is a cluster of cognitive, behavioral, and physiological symptoms that synergistically increases continued use of opioids; despite significant problems associated with their use (Sadock, Sadock, & Ruiz, 2017). This dovetails with the general definition of drug dependence; which is a syndrome in which the use of a drug or class of drugs takes priority over other behaviors that once had a higher value in a person's life. These definitions of dependence emphasize drug-using & maladaptive behaviors, that shift and become constrained over time with continued use (WHO, 2019).

Tolerance to the actions of opioid drugs does not develop uniformly and can vary widely from person to person. The general premise of tolerance is the need to take more of the substance to achieve the same effect. Long-term use of opioids changes the number and sensitivity of the opioid receptors; which has a large effect on the degree of tolerance a person develops. The symptoms of opioid withdrawal do not generally occur unless the person has been using opioids for an extended period of time or cessation is abrupt. The symptoms of opioid withdrawal include; lethargy, irritability/agitation, anxiety, insomnia, muscle aches/pain, abdominal cramping, N/V/D, runny nose, teary eyes, yawning, goosebumps, and hot/cold sweats (Sadock, et al., 2017). There is evidence pointing to a change in brain function as a result of opioid dependence, which hijacks the reward system and makes abstinence from opioids very difficult (Dr. Peter Taillac, personal communication, September 19, 2019).

<i>Summarized DSM-5 diagnostic categories and criteria for opioid use disorder</i>	
Category	Criteria
Impaired Control	<ul style="list-style-type: none"> • Opioids used in larger amounts or for longer than intended. • Unsuccessful efforts or desire to cut back or control opioid use. • Excessive amount of time spent obtaining, using, or recovering from opioids. • Craving the use of opioids.
Social Impairment	<ul style="list-style-type: none"> • Failure to fulfill major role obligations at work, school, or home as a result of recurrent opioid use. • Persistent or recurrent social or interpersonal problems that are exacerbated by opioids or continued use of opioids despite these problems. • Reduced or given up important social, occupational, or recreational activities because of opioid use.
Risky Use	<ul style="list-style-type: none"> • Opioid use in physically hazardous situations. • Continued opioid use despite knowledge of persistent physical or psychological problem that is likely caused by opioid use.
Pharmacological Properties*	<ul style="list-style-type: none"> • Tolerance as demonstrated by increased amounts of opioids needed to achieve desired effect; diminished effect with continued use of the same amount. • Withdrawal as demonstrated by symptoms of opioid withdrawal syndrome; opioids taken to relieve or avoid withdrawal.
<p>* “Pharmacological Properties” criteria are not considered to be met for those taking opioids solely under appropriate medical supervision. Severity is based on the number of criteria met: Mild: 2-3. Moderate: 4-5. Severe: 6 or more.</p>	

(American Psychiatric Association, 2013).

The DSM-V changed the terminology “opioid-abuse” and “opioid-dependence”, from previous DSM versions, to “opioid use disorder” (OUD). Opioid use disorder is a problematic pattern of opioid-use leading to clinically significant impairment or distress—including physical, mental, social, and legal problems—occurring within a 12-month period (American Psychiatric Association, 2013) & (Blanco & Volkow, 2019). Opioid use disorder remains an insidious social problem in the United States. Of the 97.5 million Americans prescribed prescription opioid medications each year, 12.5 million misused their prescription and 2.1 million meet criteria for a diagnosis of OUD (McCarty, et al., 2018). Approximately 130 Americans die each day from opioid-related overdose and it is the leading cause of death for individuals under the age of 50

(Dr. Peter Taillac, personal communication, September 19, 2019). A record was set in 2014 for the number of overdose-deaths—28,647—associated with opioids. In 2007, societal costs associated with opioid abuse was estimated to be \$55.7 billion annually (Stempniak, 2016).

Younger age, male sex, low education attainment level, unemployment, and lower income are all associated with an increased risk of developing OUD. Psychiatric disorders also increase the risk of OUD; however, risk varies by type of psychiatric disorder. At one time, the prevalence of OUD was higher among rural communities, compared to urban populations, but this is no longer the case. Compared to Asians and Hispanics populations—in the United States—there is a greater prevalence of OUD among Native Americans, African-Americans, and non-Hispanic Caucasians (Blanco & Volkow, 2019).

There are varying views on how the problem of opioid abuse in the United States became an “epidemic”. In 1970, the Controlled Substances Act (CSA) was developed to regulate possession, use, manufacture, control, enforcement, and classification of specific substances. This was an attempt to consolidate & clarify existing legislation about these substances, increase regulation to decrease abuse, and support research & treatment. However, the CSA also acknowledged that opioids are a “necessary” component to treating pain. Until about the mid 1990’s, opioid pain relievers were only used for pain associated with cancer and end of life. Advocacy groups pushed for state & federal policies to be “corrected”, to increased access to pain relievers to a broader range of individuals, and thus regulations on opioids were softened to allow for greater access (Gross & Gordon, 2019).

Some would argue that drug companies—like Purdue Pharma—are to blame for their aggressive & misleading advertising to the medical community, starting in the mid-90s, about the need to improve pain management for even minor injuries and the misconception—i.e. lie—

that opioids seldom cause addiction in individuals solely taking them for pain and prescribed under the supervision of a physician. Adequate pain control has been argued to be a basic human right. The Joint Commission on the Accreditation of Health Care Organizations (JCAHO) came out with pain management standards that directly tied to reimbursement. To determine whether these standards were met was judged by patient report on how well their pain was managed. The rate of prescription opioids sold in the US has quadrupled since 1999 and the rate of overdose-death, associated with opioids, has increased nearly identically with this increase in prescribing (Pergolizzi, LeQuang, Taylor, & Raffa, 2018). In 2012, 259 million prescriptions for opioid pain medications were filled in the US; that's enough prescriptions for each US adult to have an entire bottle of pain pills (Gross & Gordon, 2019).

Although there is ample evidence that points towards how the change in culture of pain management directly related to a change in opioid abuse, there are additional factors that contributed to the epidemic. Over half of all individuals over 11 that abused opioids reported obtaining them from a friend or relative whom obtained them legally. Clandestine labs are also producing counterfeit pain relievers and street drugs that are sold on the street. Most concerning is the increased prevalence of fentanyl, and its analogs, found in heroin, cocaine, counterfeit pills, and even marijuana. The high potency and lower cost of fentanyl drives profit-focused dealers to supplement their product (Pergolizzi, et al., 2018). Some users even seek out fentanyl-laced products for their increased potency; however, most individuals would prefer to avoid fentanyl in their drugs. Availability of all drugs has increased with the advent of "dark web" stores on the internet; where a variety of substances can be ordered and delivered to an individual without even leaving their house. Unfortunately, an increasing amount of these substances contain fentanyl, or an analog of it, that greatly increases risk of overdose death. The recent

overdose-deaths of Tom Petty & Prince, from fentanyl-laced counterfeit pain relievers, highlights how even the rich & famous are not immune to the dangers of fentanyl (Puder, 2019).

Use by Intravenous-route greatly increases the risk of infection by communicable diseases; like HIV/AIDS & Hepatitis C (HCV). Risky sexual behavior—associated with opioid-abuse—can also lead to the spread of HIV/AIDS & HCV (Gustafson, Landucci, McTavish, Kornfiels, Johnson, Mares, Westgaard, Quanbeck, Alagoz, Pe-Romashko, Thomas, & Shah, 2016). Individuals with OUD—especially those whom inject drugs—are at an increased risk for other infections such as bacterial endocarditis, endophthalmitis, cellulitis, brain/spleen/myocardial abscesses; among other infections (Blanco & Volkow, 2019).

A preliminary screening—including a complete blood panel & liver function testing—should be performed to rule-out liver dysfunction or infection. It is also important to screen for hepatitis A, B, & C, tuberculosis, HIV/AIDS, and syphilis; to determine additional comorbidities & need for additional treatments. A urine drug screen or other screening methods—that is confirmed by laboratory testing—can help determine what substances have been recently used and help monitor for ongoing use (Tusaie & Fitzpatrick, 2017).

There are multiple modalities of interventions for the treatment of OUD and other substance-use disorders. Most of these modalities begin with a detoxification from the substance(s) of abuse; and many times, this is a medically-managed withdrawal (MMW). A medically-managed withdrawal helps the individual safely taper off the substance(s) while helping to mitigate the potential dangers of physiological side effects of withdrawal. In addition, MMW is compassionate towards the individual as it can help reduce discomfort and helps to build trust among the patient and their treatment team (National Institute on Drug Abuse, 2019). Standard medical withdrawal includes access to healthcare workers 24 hours per day, an

overseeing physician or nurse practitioner to attend to patients in the case of complications & make orders for medications, and nurses who are responsible for monitoring patients during the withdrawal process & to dispense medications. The MMW area should be quiet & calm and patients should be allowed to sleep/rest in bed, perform moderate activities, and offer opportunities to engage in meditation or other calming activities. When the patient is in active withdrawal, this is not an appropriate time to engage patients in counselling or other psychological therapy; as they are often vulnerable & confused. Behavior management strategies can be implemented if the patient becomes disoriented/confused or disruptive/difficult to manage during this process (WHO, 2009).

Opioid withdrawal can be uncomfortable—like a very bad flu—and often difficult for the patient to tolerate; but opioid withdrawal is not usually life-threatening. However, pregnant women who are opioid dependent should avoid opioid withdrawal; as it can lead to miscarriage or premature labor. Patients should remain well-hydrated during the withdrawal process and can also benefit from vitamin B & C supplementation (WHO, 2009). Alpha2-adrenergic agonists—clonidine, lofexidine, and similar medications—are a non-opioid option for controlling physiological symptoms of opioid withdrawal (Gowing, Farrell, Ali, & White, 2016).

Treatment options for OUD has evolved with advances in science and changes in public policy. Standard treatment of substance use disorders has historically involved a short-term hospitalization, for detoxing off substances, followed by inpatient or outpatient counseling. Unless treatment for the underlying OUD is addressed, and better coping-skills are gained, return to use is often imminent and overdose highly likely (McCarty, Priest, & Korthuis, 2018). Removing the patient from the environment associated with their substance-use and initiating ongoing psychosocial & group treatment helps to set the stage for long-term recovery. However,

the period following discharge from an inpatient detox or jail is also associated with an increased risk of overdose death. This increased risk of death is related to a loss of tolerance while abstinent from substances and subsequently returning to the same using environment/level of use (Nunes, Gordon, Friedmann, Fishman, Lee, Chen, Hu, Boney, Wilson, & O'Brien, 2018).

Inpatient substance-abuse care began in the 1930's with two public hospitals located in Lexington, KY—for those east of the Mississippi—and Fort Worth, TX—for individuals living west of the Mississippi. These hospitals served both voluntary patients and those convicted of federal drug-crimes. In addition to medical and dental care, treatments included withdrawal management, a drug-free environment, psychotherapy, and supervision; much like is still offered today. The suggested duration of treatment was 4-6 months; however, many of the voluntary patients left following detox, while incarcerated patients were required to remain for the length of their sentence. There was a lack of aftercare following release from these hospitals and relapse was common. These hospitals were transitioned into minimum-security federal correctional facilities by the mid-1970's (McCarty, et al., 2018).

Most substance-abuse programs are currently managed outside of a hospital setting, following detox, but residential services are still available. Low and high-intensity residential services provide support to individuals whom require 24-hour care for the treatment of their substance-use disorder. These short-term programs are designed to provide transitional support to the individual through structured supervision & integration/development of coping skill. Like with many other treatment modalities, each program's staffing, underlying philosophies, and available treatments will vary widely between programs. However, the majority of programs include a peer/professional support, behavioral therapy, and promotion practices to improve wellbeing; like a balanced diet & exercise. Residential programs are most-appropriate for those

living in environments that are not conducive to sobriety; like those surrounded by individuals in active-use, homelessness, or similar situations. But access to residential programs are often greatly affected by income or insurance status; as the cost for these programs are often the responsibility of the patient and quite expensive (Tusaie & Fitzpatrick, 2017).

Outpatient programs do not require a hospital admission, but patients must already be medically detoxed or able to detox on their own. Services include group & individual treatment options, peer support groups, pharmacotherapy, drug screenings, and medical & psychological consultation. Intensive outpatient programs provide a higher level of treatment; that includes at least 9 hours of therapy per week and is often located in outpatient or hospital setting. Many patients transition from an inpatient program to intensive outpatient treatment; as a step towards less-intense outpatient & aftercare services (Tusaie & Fitzpatrick, 2017).

Medication assisted treatment (MAT) involves combining the use of medications with counseling & behavioral therapies; providing a holistic approach to treating substance use disorders. A combination of medication and therapy has been shown to greatly increase successful outcomes in treating substance-use disorders and sustaining recovery (SAMHSA, 2019). Medication assisted treatment can be implemented in both inpatient and outpatient settings. However, there is an ideological debated between abstinence-only/medication-free treatment versus MAT; thus, MAT is not available in all programs. Some would argue that MAT is simply replacing one drug for another. Whereas others argue that, based upon the medical model of addiction, MAT is treating the underlying physiological dependence to opioids while the person gains skills for continued recovery (McCarty, et al., 2018).

The Food and Drug Administration (FDA) has approved methadone (MTD), buprenorphine (BUP), and naltrexone (NTX) for the treatment of OUD. Ongoing use of these medications has been shown to significantly reduce risk of overdose, mortality, HIV & HCV transmission, criminal activity, and increases the likelihood of gaining & maintaining employment (NIH, 2018). Each of the three medication options come with their own set of barriers, advantages, and patient-specific considerations that must be carefully considered when planning treatment for OUD; however, each option has a similar efficacy if taken regularly and as prescribed (McCarty, et al., 2018). Efficacy for MAT is further increased when combined with psychosocial supports (Dr. Peter Taillac, personal communication, September 19, 2019).

Methadone (MTD) is a synthetic opioid that can be taken orally as a substitution for heroin or other narcotics being abuse. The use of MTD emerged in the 1960s and has the longest history of utilization of all MAT options. There is no need to detox from opioids prior to initiating MTD, since it's a full mu-opioid agonist, so withdrawal symptoms are suppressed. Methadone has a lengthy half-life, so a once-daily dose of 20 mg to 80 mg is usually efficacious to stabilize the patient for an entire 24-hours; however, doses as high as 120 mg per day have been used (Sadock, et al., 2017). Higher doses of MTD are associated with improved outcomes. However, overdose is possible if doses above the patient's tolerance are used or if combined with CNS-depressants like alcohol (EOTH), benzodiazepines, heroin or other opioids. So initial doses should start low and slowly increased with daily monitoring over several weeks (Blanco & Volkow, 2019). Federal regulations require that MTD is only administered through an Opioid-treatment program certified by the Substance Abuse and Mental Health Services Administration (SAMHSA). Most patients must initially attend the clinic daily to receive their dose of MTD;

however, multiple-day dosing can be provided once a period of stability is established (Sadock, et al., 2017).

Benefits of MTD are similar to other forms of MAT. It provides harm reduction by replacing more dangerous forms of opioids & methods of ingestion for a regulated, daily oral formulation; reducing the risk of overdose and spreading HIV/HCV through IV use. When MTD is taken long-term, there are minimal euphoric effects and it generally doesn't cause sedation or depression. Patients on MTD can gain meaningful employment rather than participating in criminal activities to support their habit. The main drawbacks of MTD is the limited availability—due to federal restrictions on who can prescribe and where it can be dispensed—and the patient remains dependent upon a narcotic (Sadock, et al., 2017).

Buprenorphine (BUP) is a partial mu-opioid receptor agonist that can be dispensed in an outpatient setting. It's a schedule III medication and must be prescribed by a clinician with specialized training & certification; physicians require an 8-hour training and APRNs & PAs require a 24-hour training. A daily dose of 8 to 10 mg—given in split-doses as often as TID—helps to reduce opioid-cravings & use (Sadock, et al., 2017). And SUB can attenuate or block the effects of parenterally administered opioids—since it has such a slow disassociation from opioid receptors—and does not generally suppress respiration. Buprenorphine is associated with a lower rate of lethality than MTD, but can still lead to overdose-death if combined with other CNS depressants (Blanco & Volkow, 2019). Other potential side effects of SUB include constipation, sweating, nausea/vomiting, and sexual difficulties; rates of these side-effects are similar between SUB & MTD. Abruptly discontinuing SUB, following long-term administration, will often lead to a mild opioid withdrawal syndrome (Sadock, et al., 2017). There are four formulations of SUB available; sublingual BUP, sublingual BUP/naloxone—to

decrease abuse potential—, 6-month BUP-implant, and the newly developed long-acting injectable version; administered on a monthly basis (McCarty, et al., 2019).

Naltrexone (NTX) is a competitive, full-antagonist to the mu-opioid receptor that, when taken regularly & at sufficient doses, blocks the reinforcing effects of opioids & EOTH. In addition, NTX is not associated with tolerance, abuse, or withdrawal and is shown to decrease the likelihood of opioid overdose and alcohol & opioid relapse. Because it's not a controlled substance, NTX can be prescribed in a variety of clinical settings. However, oral NTX is associated with poor treatment adherence; and can be difficult to initiate someone on it due to the chance of triggering withdrawal if they currently have opioids in their system (Sigmon, Bisaga, Nunes, O'Connor, Kosten, & Woody, 2012). There is an extended-release formulation of NTX, that comes in a monthly 380 mg intramuscular injection, that has been shown to have a much higher adherence than oral NTX and similar efficacy to MTD & BUP if successfully inducted (Nunes, et al., 2018). Individuals that continue to use opioids while on NTX have higher rates of non-opioid illicit drug use, IV use, and legal problems than those who abstain. Although NTX has been shown to block the reinforcing effects of opioids, there are some subjective reports that some high is possibly after the 3rd week following injection; oral NTX must be taken daily to maintain opioid receptor antagonist effect (Lott, 2018).

An individual must be opioid-free for 7-10 days prior to initiating NTX or it can trigger withdrawal symptoms or decrease tolerability. Opioid withdrawal—especially when antagonist-precipitated—can exacerbate underlying psychiatric & physical disorders like anxiety, depression, psychosis, altered sensorium, glycemic control, and hemodynamic control. In some cases, individuals will first be switched from heroin—or other opioid of abuse—to MTD or BUP and then tapered off. Another route to preparing for induction is the use of clonidine to decrease

withdrawal symptoms; allowing the individual to fully taper off opioids in preparation for NTX (Sigmon, et al., 2012). Naltrexone induction is especially ideal for situations where individuals are already medically detoxed, incarcerated, in-patient, or other situation where they are no longer have opioids in their system. Since NTX isn't an opioid, many people choose this option over other MAT options because they do not want to be "dependent" on an opioid or they are in professions that doesn't allow opioids to be in their system (Friedmann, et al., 2018).

Many individuals with OUD have a disproportionately increased prevalence of criminal charges; most-often directly related to their substance use (Friedmann, Wilson, Nunes, Hoskinson, Lee, Gordon, Murphy, Bonnie, Chen, Boney, & O'Brien, 2016). In collaboration between substance-abuse treatment programs and the criminal justice system, drug court (DC) allows non-violent drug offenders to participate in substance abuse treatment in lieu of jail. There are over 2,700 DC programs across the USA. The prevalence of individuals with OUD in DC has increased 3-fold in the past decade. The goal of DC is to reduce recidivation & use of substances through non-adversarial approaches, supervised treatment, frequent drug screens, and sanctions when rules of the program are violated. Incarceration and/or DC can provide a rare window in which a person is detoxed from drugs and more-easily reached to engage in treatment during a time when this population will have structure, supervision, and accountability (Robertson & Swartz, 2016).

Efficacy varies among different DC, but in general, DC greatly reduces recidivation or incarceration. When DC is combined with MAT, there is an even higher rate of success and improved outcomes. Naltrexone is especially ideal in the context of DC due to the highly structured environment that increases the likelihood of adherence (Robertson & Swartz, 2016).

Aftercare services are an important factor in continued recovery from OUD and other addictive disorders. Support groups, like Alcoholics or Narcotics Anonymous (AA or NA), provide a community of like-minded individuals that can help encourage & support continued recovery because they have a deep understanding of what the individual has gone through. The 12-step model of AA includes the admission that the individual is powerless over their substance(s) of choice/abuse and they must “turn it over” to a higher power. Many members will establish a “sponsor” and/or become sponsors to receive/provide individualized support for recovery. Members are also encouraged to “atone” for their misbehaviors, related to substance abuse, and make amends with those they may have harmed. The AA model is abstinence-based and sometimes strongly counsels against MAT. There are also nonspiritual support groups that focus on inner-strength & motivation rather than spiritual/religious powers and groups that are not abstinence-based (Hardey, Thomas, Stein, Kelly, Ackermann, 2019).

Continued individual & group counseling is another important form of aftercare. This includes treating any underlying or comorbid mental health disorders that can affect a person’s ability to remain in recovery. It also provides continued support, accountability, and supervision that helps structure the individual’s life in such a way to improve their overall functioning and motivation for continued abstinence or non-pathological use. This can also include ongoing management of MAT through a clinic or doctor’s office (Blanco & Volkow, 2019).

Implications

The key to recovery is support & compassion. This begins by decreasing stigma related to substance abuse & mental illness and recognizing OUD as a disease; rather than a moral failing. Fear of stigma can lead individuals to forego treatment, leading to poorer outcomes. As discussed earlier, there is a physiological component to OUD that can be successfully addressed

by MAT. Continued education to the public, families, & clinicians—that OUD is a disease, there are many treatment options available, and that change is possible—can help to increase awareness, decrease resistance to effective methods of treating this disease, and help to develop an environment where an individual with OUD is more-willing to accept help & feels supported.

Continued research regarding best-practices and additional ways of treating OUD—and other addictions—must continue. In addition, research into adequate pain management and ways to mitigate the potential for over-use/abuse is also important. Treating someone with both chronic pain and OUD is a challenge because chronic pain significantly increases the risk of relapse (Gross & Gordon, 2019).

Entheogenic substances—also known as psychedelics or hallucinogens—have been used medically & spiritually by cultures all over the world for thousands of years. From 1950-1970, there was a great deal of research into classic hallucinogens—like mescaline, psilocybin, and lysergic acid diethylamide (LSD)—with promising results for the treatment of addiction, depression, anxiety, and other mental health conditions. Treatment of alcohol addiction with LSD was an accepted clinical treatment in Canada. And Bill Wilson, co-founder of AA, credited LSD for his successful recovery from alcohol addiction; he even advocated for its use in conjunction to AA, but was unsuccessful gaining support. But during the 1960s, there was a social/cultural uprising against psychedelics, due to misuse outside of the laboratory/clinical setting, and these substances were added to the CSA as a schedule I substance; completely restricting their use and essentially stopping all research (Bogenschutz & Johnson, 2016).

After nearly four decades of federal restrictions on psychedelic research, there is renewed interest & research into the use of these substances for the treatment of addiction and other mental health conditions. A meta-analysis of 6 studies involving over 500 participants

confirmed that LSD provides substantial reduction in self-administration of alcohol after just one session (Burdick, & Adinoff, 2013). A multi-site research study on psilocybin, conducted at the University of New York & Johns Hopkins, found that 35% of participants remained smoke-free after 6 months with the use of varenicline—which is widely accepted as the most-successful option for smoking cessation currently available—compared to an 80% success rate in the psilocybin-treatment group (Noorani, Garcia-Romeu, Swift, Griffiths, Johnson, 2018). Ibogaine is an alkaloid derived from a root found in Africa, *Tabernanthe iboga*, that has shown great promise in successfully treating opioid & stimulant abuse disorders. The use of entheogenic substances is generally safe, associated with low toxicity—although ibogaine has some cardio-toxic properties—, non-physiologically addictive, and associated with significant, positive, long-lasting effects. The exact mechanism of how these substances change behaviors is still unknown (Burdick, & Adinoff, 2013). In addition to FDA approval, there are still many questions that will need to be answered before these substances should be considered for the treatment of addiction and other mental health disorders. These questions relate to determining; the efficacy of entheogenic therapies, the appropriate patient screening criteria, and how to apply/administer these substances in a clinical setting. And the question still remains whether the effects of entheogenic substances is the physiological mechanism of the substance, the altered state of consciousness that allows for deep introspection, a combination of these, or some other explanation.

Although the general paradigm about MAT seems to be shifting towards greater acceptance for its value & applicability in treating OUD, there are still many clinicians, courts, & agencies that are resistant to offering this as a treatment option. Increasing access to MAT programs is of the utmost importance in combating the opioid crisis. Over-prescribing of opioid

medications by clinicians had a direct impact upon increasing opioid-misuse/abuse. Providing MAT in clinics or medical offices is an impactful way to help make amends for this impact and help those suffering from OUD.

Rural communities at one point had a higher rate of OUD compared to higher-populated regions of the country. Although rates of OUD are currently similar between these two areas, access to substance-abuse treatment—especially MAT—remains much lower in rural communities (Blanco & Volkow, 2019). Incentives for clinicians to serve in rural communities, technologies like tele-health services, increased use of MAT in drug-courts, and satellite/mobile clinics are just a few ways that access to treatment can be increased in rural communities.

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