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Management of Opioid Use Disorder Treatment

An Overview

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It is important for nurses not working in the area of addictions to be informed of the diagnosis and treatment of opioid use disorder so that they may serve as a resource, educate others, and influence and refer individuals to seek treatment on the basis of best evidence. In this article, we provide an overview of the postscreening diagnosis and treatment of opioid use disorders with an emphasis on medication-assisted treatment, starting with the definition of substance use disorder, tolerance, dependence, and addiction.

Introduction

With nearly 200 people dying of drug overdose every day (National Institute on Drug Abuse, 2019), the United States is enduring a death toll equal to September 11 every 15 days. The deaths are a dire reminder not only of the lives lost to this epidemic but also of the more than 2 million (Salmond & Allread, 2019) people in the last year who overdosed on opioids but did not die. These 2 million people are misusing and possibly addicted to opioids, and if they can be directed into harm reduction and treatment, they will not be needlessly added to next year's statistics. It is important for nurses not working in the area of addictions to be informed of the diagnosis and treatment of opioid addiction so that they may serve as a resource, educate others, and influence and refer individuals to seek treatment based on best evidence. In this article, we provide an overview of the postscreening diagnosis and treatment of opioid use disorders (OUD) with an emphasis on medication-assisted treatment (MAT), starting with the definition of substance use disorder, tolerance, dependence, and addiction. This article does not address the process of screening and referral. However, it is important to note that, given the prevalence of opioid and other substance use disorders in the United States, OUD screening needs to be scaled up in a wide range of community and hospital settings.

Opioid Use Disorder

The *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition; *DSM-V*) made significant changes to the definition and descriptions of substance disorders (American Psychiatric Association, 2013). There are no longer diagnoses of substance dependence and substance abuse, rather these have been combined into the diagnostic code **substance use disorder** that is further classified according to substance type (alcohol, opioids) and severity (mild, moderate, or severe). An opioid substance use disorder is when the recurrent use of opioids causes clinically and functionally significant impairment, such as health problems, disability, and failure to meet major responsibilities at work, school, or home. The severity is decided on the basis of the number of diagnostic criteria present. Table 1 lists the diagnostic criteria and classification of OUDs according to the American Psychiatric Association's *DSM-V*.

An important distinction in the *DSM-V* criteria is that the diagnosis does not apply to individuals experiencing symptoms under appropriate medical supervision, as with those being treated for chronic pain. Persistent, moderate to severe pain is a characteristic of many patients with a number of chronic conditions including back pain or osteoarthritis (de Leon-Casada, 2013). Some of the individuals treated with opioids for pain management will develop OUD. Others will develop tolerance and physical dependence but not experience cravings, not need escalated dosages, and not have lifestyle problems related to drug use.

Tolerance, Dependence, and Addiction

Tolerance, dependence, and addiction are discrete and different phenomena that can occur when opioids are used for prolonged periods of time. **Tolerance** occurs when the person no longer responds to a drug—in this

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Table 1. Diagnostic Criteria and Classification of Opioid Use Disorders[a]

A problematic pattern of opioid use leading to clinically significant impairment or distress, as manifested by at least two of the following diagnostic criteria, occurring within a 12-month period:

1. Opioids are often taken in larger amounts or over a longer period than was intended.
2. There is a persistent desire or unsuccessful efforts to cut down or control opioid use.
3. A great deal of time is spent in activities necessary to obtain the opioid, use the opioid, or recover from its effects.
4. Craving, or a strong desire or urge to use opioids.
5. Recurrent opioid use resulting in a failure to fulfill major role obligations at work, school, or home.
6. Continued opioid use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of opioids.
7. Important social, occupational, or recreational activities are given up or reduced because of opioid use.
8. Recurrent opioid use in situations in which it is physically hazardous.
9. Continued opioid use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.
10. Tolerance, as defined by either of the following:
    a. A need for markedly increased amounts of opioids to achieve intoxication or desired effect.
    b. A markedly diminished effect with continued use of the same amount of an opioid.

    Note: This criterion is not considered to be met for those taking opioids solely under appropriate medical supervision.
11. Withdrawal, as manifested by either of the following:
    a. The characteristic opioid withdrawal syndrome (refer to Criteria A and B of the criteria set for opioid withdrawal).
    b. Opioids (or a closely related substance) are taken to relieve or avoid withdrawal symptoms

If using the *ICD-10-CM* codes, opioid use disorder is coded by severity of symptoms, as follows:

- Mild: Presence of 2–3 symptoms.
- Moderate: Presence of 4–5 symptoms.
- Severe: Presence of ≥6 symptoms.

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case opioids—in the way he or she initially responded. It takes a higher dose of the drug to achieve the same level of response achieved initially (National Institute on Drug Abuse, 2017). Tolerance results from the ability of opioids to desensitize the brain's own natural opioid system, making it less responsive over time (Williams et al., 2013). Higher doses of opioids are needed to stimulate the μ receptors (the primary sites of action for the most commonly used opioids) of the mesolimbic reward system to release the same amount of dopamine (Kosten & George, 2002). When individuals who have been using opioids stop using for a period of time and then restart opioid use, they are at risk for overdose as they would have lost their tolerance during the period of abstinence.

Dependence develops "when the neurons adapt to the repeated drug exposure and only function normally in the presence of the drug" (National Institute on Drug Abuse, 2007). In essence, the brain functions normally when the drugs are present and abnormally when they are not. This is caused by changes in the secretion of noradrenaline within the locus coeruleus at the base of the brain (the locus coeruleus is a nucleus in the pons involved with physiological responses to stress and panic; it is the main site for the synthesis of noradrenaline). In addition, opioids link with the μ receptors within the locus coeruleus at the base of the brain and suppress the neurons' release of the noradrenaline that is normally distributed to other parts of the brain stimulating wakefulness, breathing, blood pressure, and general alertness. In the presence of suppression of noradrenaline, there is drowsiness, slowed respiration, and low blood pressure. With repeated exposure to opioids, the brain adapts by increasing the level of noradrenaline activity; when opioids are present, their suppressive impact combined with the heightened activity leaves the patient feeling more or less normal. But when the person stops the opioids, the brain cells secrete excessive amounts of noradrenaline triggering several physiological reactions including jitters, anxiety, muscle cramps, and diarrhea—all signs of withdrawal (National Institute on Drug Abuse, 2017). Symptoms of opioid withdrawal are listed in Table 2. The symptoms of withdrawal tend to reinforce the user's ongoing use of opioids to avoid these unpleasant sensations.

The individual who is physically dependent on opioids is not necessarily addicted. Addiction occurs in a minority of those who develop dependence. However, with continued use, the person who is dependent may be less able to exert self-control and can become seriously impaired. The National Institute on Drug Abuse (2014) defines **addiction** (comparable to severe OUD) as a "chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences." In the past, addiction was believed to be associated with lack of willpower and moral strength. We now know that addiction is associated with morphologic brain changes in the areas of the brain that are critical to judgment, decision making, learning, memory, and behavior control; these changes contribute to the cravings and harmful behaviors associated with addiction (Kosten & George, 2002; Younger et al., 2011). Kosten and George (2002) stated that the opioid abuser's

Table 2. Management of Opioid Withdrawal Side Effects[a]

Symptoms	Medication[b]
Abdominal cramping	Dicyclomine
Anxiety	Diazepam or hydroxyzine
Bone, muscle, joint, or other aches and pains	Nonsteroidal anti-inflammatory drug (NSAID), such as naproxen or ibuprophen
Increased pulse rate and blood pressure, anxiety, chills, piloerection	Clonidine, clonidine patch, tizanidine, or lofexidine[c]
Insomnia	Temazepam or promethazine
Diarrhea	Loperamide
Muscle spasm, twitching, or tension	Methocarbamol
Nausea and vomiting	Prochlorperazine, ondansetron, or metoclopramide

[a]In addition to symptom management, perform a physical examination; treat abscesses from injections and related conditions; rule out/treat human immunodeficiency virus infection, hepatitis, and other infections; and screen patient for willingness to participate in a rehabilitation program.
[b]Medications are administered according to symptoms; not all medications are administered to every patient. Also, there are few definitive data indicating that any drug of a class (e.g., naproxen as an example of an NSAID) is superior to any other drug of the class. The medications listed are examples (Gowing et al., 2014; Kowalczyk et al., 2015).
[c]Clonidine and tizanidine are used on an off-label basis for opioid withdrawal. Lofexidine was approved by the FDA in May 2018 (FDA, 2018; Schuckit, 2016).

struggle for recovery is in great part a struggle to overcome the effects of these changes. The abnormalities that produce addiction are wide-ranging, complex, and long-lasting and can produce cravings that lead to relapse months or years after the individual is no longer opioid dependent (Kosten & George, 2002).

Treatment of OUDs: Withdrawal and Detoxification

The first step in the treatment of OUD is detoxification (also referred to as detox), or withdrawal management, from the opiate on which the individual has become physically dependent. Detoxification is not treatment; it is the first step in the recovery process. Detoxification may occur in either inpatient or outpatient settings. There is no demonstrable difference in relapse among inpatient versus outpatient withdrawal management; however, inpatient detox has higher rates of completion (American Society of Addiction Medicine [ASAM], 2015). There are a number of ways to detoxify a patient from opioids—cold turkey, symptomatic treatment of withdrawal symptoms, tapered doses of methadone, buprenorphine, and low doses of oral naltrexone, and the nonnarcotic detox systems—with mixed success.

Cold turkey: "Cold turkey" is when an individual who is dependent or addicted suddenly stops using without replacing the stopped opioids with medications during the withdrawal process. In the "cold turkey" approach, patients will become increasingly uncomfortable, anxious, and agitated, and experience increased sweating about 8–12 hours after the last dose of opioids. Over the next 12–24, hours the patient may experience physical symptoms such as aching, sweating, and increased bowel motility but these symptoms are more likely to be prominent at 36–48 hours. Symptoms are likely to reach maximum intensity over the 36- to 72-hour period and then tail off (Kleber, 2007). "Cold turkey" is *not* the recommended course of action. Evidence shows that relapse rates are highest with this approach (Dixon & Xiong, 2018), perhaps returning to drug use simply to stop the withdrawal symptoms and intense cravings.

Symptomatic treatment: A second approach would be symptomatic treatment of withdrawal symptoms, using an α-2 agonist such as clonidine and lofexidine (see Table 2). Treatment with these agonists results in less severe withdrawal symptoms and better retention in detox programs.

Buprenorphine: The third protocol for opioid detox is the use of buprenorphine, an opioid agonist (see Box 1). Compared with clonidine or lofexidine, people receiving buprenorphine have less severe signs and symptoms, fewer side effects, are more likely to stay in treatment longer, and more likely to complete treatment (Gowing, Ali, White, & Mbewe, 2017).

Tapered doses of methadone: The fourth approach to opioid detox is the use of tapered doses of methadone (also an opioid agonist), which is similarly as effective as buprenorphine (Gowing et al., 2017). The use of medications such as methadone or buprenorphine to manage the withdrawal is based on the principle of cross-tolerance during which one opioid is replaced with another and withdrawn slowly (Dixon & Xiong, 2018). Evidence shows that this medication-supported approach is more effective than either "cold turkey" or the use of an α-2 agonist alone.

Buprenorphine and low doses of naltrexone: Another approach to detox, which is promising but needs more research before it can be accepted as standard practice, is the combination of buprenorphine and low doses of oral naltrexone to rapidly detoxify patients. Detox is then followed by a 7- to 14-day waiting period after which extended-release injectable naltrexone is administered to mark the initiation of MAT (Sigmon et al., 2012).

Other approaches: Novel, nonnarcotic detox systems for reduction in the symptoms of opiate withdrawal, recently approved by the Food and Drug Administration (FDA, 2017; FDA, 2018) include two electric stimulation devices that reduce symptoms of opioid withdrawal. One of these devices (the NSS-2 Bridge by Innovative Health Solutions, Versailles, Indiana) is a percutaneous nerve field stimulator

Box 1. Key Pharmacological Terms

Endogenous opioids (endorphins): An umbrella term referring to neurotransmitters or neuropeptides that have morphine-like activity triggered by pain and stress. They bind to opioid receptors, the mu (μ), kappa (κ), and delta (δ) varieties, in both the central and peripheral nervous system and alter neural signal transmission leading to pain relief and increased sensations of well-being (McDonald & Lambert, 2016; Pasternak & Pan, 2011).

Opioids: Many drugs are referred to as opioids. Drugs such as morphine and codeine are alkaloids naturally derived from the opium poppy and are referred to as *opiates*. In addition to natural opiates, there are semisynthetic and synthetic opioids. *Semisynthetic opioids* are produced from naturally occurring opiates (oxycodone and hydrocodone from thebaine and heroin from morphine) and *synthetic opioids*, made entirely from chemicals, include drugs such as methadone and fentanyl. These drugs are chemically related and have a common mechanism of action but vary in strength (Keating & Granados, 2017).

Agonist: It is a drug that fully stimulates the μ receptor. Increasing doses of full agonists produces increasing effects until a maximum effect is reached or the receptor is fully activated. Agonists include methadone, morphine, heroin, oxycodone, and hydromorphone.

Antagonists: These are drugs that block binding at the μ receptor site and do not allow agonists to have any effect. Antagonists are like keys that fit into locks; but instead of opening the door, they prevent other keys from being inserted into the locks. Antagonists include naltrexone and naloxone.

Partial agonists: These are a combination of both agonist and antagonist to the μ opioid receptor. Partial agonists bind to receptors and activate them but are only partly effective in comparison with the full agonist. The partial agonist effect will reach a maximum level, even if the dose continues to rise. This is referred to as a "ceiling effect." As higher doses are reached, partial agonists can act like antagonists—occupying receptors but not activating them (or only partially activating them), displacing or blocking full agonists from the receptors (Center for Substance Abuse Treatment, 2004). Buprenorphine is a partial agonist.

system (Innovative Health Solutions, 2018), the other (Drug Relief by DyAnsys, Inc., San Mateo, California) is an auricular neurostimulation device (Gingerich, 2018). Both can be used for up to 5 days during the acute phase of opioid withdrawal. Although there are case studies attesting to their effectiveness, neither has been tested using randomized controlled trials (Rubin, 2017).

Detox—pulling it all together: Of the opioid withdrawal approaches, those with the most evidence for success are methadone and buprenorphine; methadone and buprenorphine have comparable results in terms of retention and opioid abstinence (ASAM, 2015). There is no standard template for whether to use methadone or buprenorphine. This decision, which is usually made by the clinician in consultation with the patient, involves many areas of consideration including the following:

- Timing (buprenorphine cannot be used if opioids are still in the system)
- Setting (buprenorphine can be prescribed in either the clinic- or office-based setting)
- Methadone is usually prescribed in a clinic-based setting or opioid treatment program to prevent abuse
- Success during previous withdrawal experiences (client and family preference)
- Co-occurring medical and psychiatric illnesses
- Patient capacity to adhere to recommended treatment (if high risk for dropping out, evidence favors methadone maintenance)
- Legal status (patients with legal charges, drug-using social networks, and co-occurring disorders might prefer the structure of the opioid treatment program)
- Treatment plan for MAT beyond withdrawal
- Whether the patient is seeking abstinence from all opioid use (Connery, 2015)

When using buprenorphine for withdrawal, it is important that it not be started immediately. Because buprenorphine is a partial agonist, it can precipitate withdrawal. As such, it should be administered only once the patient is exhibiting signs and symptoms of withdrawal—12–18 hours after the last dose of a short-acting agonist such as heroin or oxycodone and 24–48 hours after the last dose of a long-acting agonist such as methadone. In contrast, if methadone is used during withdrawal, as it is a full opiate agonist, treatment can be initiated prior to the onset of withdrawal as withdrawal will not be precipitated with its use. Withdrawal management is typically completed within 6–10 days when using methadone and somewhere between 3 and 30 days when using buprenorphine (ASAM, 2015).

In addition to administration of the opioid agonist, the patient going through withdrawal is also provided with treatment to lessen the multiple symptoms of opioid withdrawal. Commonly used medications to treat withdrawal symptoms are provided in Table 2.

When using buprenorphine, methadone, or naltrexone (naltrexone is used after opiate withdrawal because of precipitated withdrawal) for opiate withdrawal, concomitant use of clonidine or lofexidine, both α-2 agonists, has been shown to be beneficial in reducing side effects and staying in treatment longer (Dixon & Xiong, 2018). In randomized double-blind placebo-controlled clinical trials, lofexidine (in combination with methadone, buprenorphine, or naltrexone) was found to lessen the severity of withdrawal symptoms and increase the likelihood of completing a 7-day opiate withdrawal regimen. Lofexidine and clonidine are similarly effective, but lofexidine has less effect on blood pressure (Gowing, Farrell, Ali, & White, 2016), lower levels of withdrawal symptoms, fewer mood problems, and less sedation. Because lofexidine does not produce hypotension, it can safely be used in outpatient treatment (Gerra et al., 2001). Lofexidine was FDA approved in May 2018 (FDA, 2018).

Validated clinical scale: Regardless of which withdrawal management approach is used, it is recommended that a validated clinical scale such as the Clinical Opiate Withdrawal Scale (COWS) be used to identify and quantify the severity of opioid withdrawal symptoms to support safe patient monitoring. The Clinical Opiate Withdrawal Scale is an 11-item scale where the clinician rates common signs and symptoms of opiate

withdrawal (see Table 3), facilitating monitoring of progress over time. The summed score for the complete scale can be used to help clinicians determine the stage or severity of opiate withdrawal and assess the level of physical dependence on opioids (Wesson & Ling, 2003).

Treatment of OUDs With Medication-Assisted Treatment

Medication-assisted treatment is the use of opioid agonists, partial agonists, or antagonists (see Box 1) along with psychosocial treatment (described later in this article) for opioid addiction. Medication-assisted treatment has been shown to be more effective than psychosocial treatment alone (without the use of medication; Connery, 2015). Despite the strong evidence base in favor of MAT, changes in practice have lagged. Most people who are addicted are not receiving MAT. For every million people who are receiving MAT, there are 1.5 million not receiving it (Volkow, Frieden, Hyde, & Cha, 2014).

There are 3 primary medication options used for treating OUD: methadone, buprenorphine, either with or without naloxone, and naltrexone (Substance Abuse and Mental Health Services Administration, 2015a). It has been shown that these therapies keep people in treatment, away from illicit activity, and reduce morbidity and mortality (Kourounis et al., 2016). The decision on which medication to use is usually made by the clinician and the patient; factors that weigh into this decision include DNA testing and pharmacogenomic consultation (Ettienne et al., 2017); past treatment history; patience/family preference; treatment setting; occupation (as methadone is a narcotic, it can make users feel drowsy or less alert, whereas patients on buprenorphine are relatively "clear-headed"); and the factors previously listed regarding detoxification medication decision making.

The three medication options for MAT vary on the basis of their actions on the μ or opioid receptors. **Methadone** is a full opioid agonist, meaning it fully stimulates the μ receptor. Methadone is a long-acting opioid: it stays in the brain and the body for days, unlike morphine, heroin, oxycodone, and other addictive opioids that remain in the system for only a short time. Methadone causes dependence, but because of its steady influence on the μ opioid receptors, it produces minimal tolerance and alleviates cravings. When the cravings disappear, so does the typical compulsive drug use (Kosten & George, 2002). Methadone produces a very low euphoric effect at moderate doses. Initially, it is administered at a clinic on a daily basis where patient urine specimens are monitored and drug counseling is provided. This structure and routine may assist patients to remain in maintenance therapy; others may find that needing to go to the clinic every day impairs adapting to normal, everyday life (Warren, Huot, Magalhães, & Evans, 2016). After a significant period of illicit opioid abstinence has been achieved, the clients may be given the option of take-home methadone. There is a potential for abuse of methadone if taken at doses higher than prescribed. Patients stay on methadone for 6 months to 3 years, and some longer. Relapse is more common among patients who discontinue methadone after 2 years or less (Kosten & George, 2002).

LAAM (levo–alpha–acetylmethadol) is a longer acting derivative of methadone that can be given three times per week. However, recent concerns about heart rhythm problems have limited its use (Kosten & George, 2002).

Buprenorphine in both formulations (with and without naloxone) is a partial opioid agonist. Classified as a schedule III drug like methadone, buprenorphine also suppresses cravings but has a wider margin of safety due to a ceiling effect (see Box 1). This ceiling effect results in a lower risk of diversion and overdose. Buprenorphine is available as a monotherapy and a buprenorphine–naloxone combination (Suboxone). Buprenorphine mono-product is available as an oral dose once a day, sublingual film, once/monthly intramuscular injection, and 6-monthly subcutaneous implantable formulation (Kenney, Anderson, Bailey, & Stein, 2018). Drawbacks of buprenorphine mono-product are that it can complicate pain treatment, the potential for precipitated withdrawal, and the potential for intravenous use. When used intravenously, some opiate abusers claim to get "high" from buprenorphine (Lofwall & Walsh, 2014). It can also increase respiratory suppression if used intravenously (Foster, Twycross, Mihalyo, & Wilcock, 2013).

Buprenorphine in combination with naloxone, a short-acting antagonist, makes buprenorphine less likely to be used intravenously. When someone tries to divert (i.e., the use of these drugs for nonmedical purposes to get "high") the buprenorphine–naloxone combination, it will precipitate withdrawal and block the efficacy of the buprenorphine (Yokell, Zaller, Green, & Rich, 2011). Buprenorphine–naloxone combination is available as a sublingual film and sublingual tablet.

Buprenorphine (with or without naloxone) can be prescribed in an office-based setting by midlevel practitioners and there are minimal drug interactions except with central nervous system depressants (ASAM, 2015). Women receiving buprenorphine/naloxone who become pregnant were usually switched to buprenorphine alone or methadone because of a theoretical concern that a precipitated withdrawal could incite premature labor and fetal demise. However, a study by Krsak, Trowbridge, Regan and Freedman (2017) found that buprenorphine in combination with naloxone is a safe alternative to both methadone and buprenorphine alone. Other studies have found that buprenorphine (with or without naloxone) has the advantage of being safer than methadone in terms of risk of preterm birth, greater birth weight, larger head circumference, and neonatal abstinence syndrome (Coulsone, Lorencz, Ramage, Gannon, & Galvin, 2018; Lemon, Caritis, Venkataramanan, Platt, & Bodnar, 2018; Zedler et al., 2016). Neonatal abstinence syndrome refers to the signs and symptoms experienced by newborn infants forced to withdraw from substances used or abused by their mothers during pregnancy.

Naltrexone is an opiate antagonist (see Box 1) that comes in an oral daily form, a once monthly injectable form, and an implantable 2- to 6-month formulation (Krupitsky & Blokhina, 2010). This medication must not be used in people currently taking opiates, including methadone, as it can cause sudden withdrawal symptoms. To reduce the risk of precipitated withdrawal,

Table 3. Clinical Opiate Withdrawal Scale for Measuring Symptoms[a]

Sign or Symptom	Scoring	Patient Score
Resting pulse rate measured after patient has been sitting or lying for 1 min—beats per minute		
≤80	0	
81–100	1	
101–120	2	
>120	4	
Sweating during past half hour not accounted for by room temperature or physical activity		
No report of chills or flushing	0	
Subjective report of chills or flushing	1	
Flushed or observable moisture on face	2	
Beads of sweat on brow or face	3	
Sweat streaming off face	4	
Restlessness observed during assessment		
Patient able to sit still	0	
Patient reports difficulty sitting still but is able to do so	1	
Frequent shifting or extraneous movements of legs and arms	3	
Patient unable to sit still for more than a few seconds	5	
Pupil size		
Normal size for room light	0	
Possibly larger than normal for room light	1	
Moderately dilated	2	
So dilated that only rim of iris is visible	5	
Bone or joint aches[b]		
None	0	
Mild, diffuse discomfort	1	
Severe diffuse aching of joints, muscles, or both	2	
Patient is rubbing joints or muscles and is unable to sit still because of discomfort	4	
Runny nose or tearing not accounted for by cold symptoms or allergies		
None	0	
Nasal stuffiness or unusually moist eyes	1	
Nose running or tearing	2	
Nose constantly running or tears streaming down cheeks	4	

(*continues*)

Table 3. Clinical Opiate Withdrawal Scale for Measuring Symptoms[a] (*Continued*)

Sign or Symptom	Scoring	Patient Score
Gastrointestinal upset during past half hour		
None	0	
Stomach cramps	1	
Nausea or loose stool	2	
Vomiting or diarrhea	3	
Multiple episodes of diarrhea or vomiting	5	
Tremor in outstretched hands		
None	0	
Tremor can be felt but not observed	1	
Slight tremor observable	2	
Gross tremor or muscle twitching	4	
Yawning observed during assessment		
None	0	
Once or twice during assessment	1	
Three or more times during assessment	2	
Several times/min	4	
Anxiety or irritability		
None	0	
Patient reports increasing irritability or anxiousness	1	
Patient obviously irritable or anxious	2	
Patient so irritable or anxious that participation in assessment is difficult	4	
Piloerection		
Skin is smooth	0	
Piloerection of skin can be felt or hairs standing up on arms	3	
Prominent piloerection	5	
Total score		

[a]For each item, the clinician should record the score that best describes the patient's signs or symptoms. Only signs or symptoms that are related to opiate withdrawal should be rated. For example, if the patient's heart rate is increased because he or she was jogging just before the assessment, the increased pulse rate would not be included in the score. Scores should be entered at time zero, 30 minutes after the first dose of buprenorphine, 2 hours after the first dose, and so forth. A score of 5–12 indicates mild withdrawal, 13–24 moderate withdrawal, 25–36 moderately severe withdrawal, and more than 36 severe withdrawal (Wesson & Ling, 2003).

[b]Only pain that is directly linked to withdrawal from opiates should be scored. A version of the COWS that may be copied and used clinically can be downloaded from https://www.drugabuse.gov/sites/default/files/files/ClinicalOpiateWithdrawalScale.pdf.

PDF-formatted versions of the COWS are also available from the websites of the American Society of Addiction Medicine, the California Society of Addiction Medicine, and other sites (Wesson & Ling, 2003).

patients should be warned to abstain from opioids (illicit or prescription) for at least 7–10 days before starting naltrexone (Substance Abuse and Mental Health Services Administration, 2016).

Among the three MAT options, methadone and buprenorphine have shown greater success rates than naltrexone oral. However, when naltrexone once monthly injectable was compared with buprenorphine, efficacy rates were close to equal. When methadone was compared with buprenorphine, their efficacy rates were similar if patients remained in treatment. However, there was greater patient "dropout" among buprenorphine users compared with those prescribed methadone (National Institute on Drug Abuse, 2018).

Although **naloxone** is an opiate antagonist, it is too fast acting with a very short half-life. This is why it alone is not considered as a viable treatment option other than to reverse opiate overdose (Rzasa & Galinkin, 2018).

Psychosocial Treatment

By definition and by federal law, MAT includes the use of not only medications but also counseling and behavioral therapies along with medical, vocational, educational, and other assessment and treatment services (e.g., healthy eating, exercise, smoking cessation, and stress management) to provide what Substance Abuse and Mental Health Services Administration (2015b) refers to as a "whole-patient" approach to the treatment of substance use disorders.

The psychosocial treatment aspects of MAT can include individual and group counseling, case or care management, and recovery support services (which covers everything from transportation, employment, educational support, housing support, peer-to-peer services, and faith-based support to outreach), including 12-step fellowship. These services can be provided in settings such as inpatient and residential treatment, intensive outpatient treatment, partial hospital programs, and the community. It is important to note that these services go beyond the relationship between the patient and care provider(s) and offer long-term support to reduce risk of relapse. A white paper by Barberg (2018) introduces the concept of optimized MAT, which in addition to precision medication (i.e., regimens tailored to individual variability in genes, environment, and lifestyle) includes a coordinated, proactive, whole-person care plan; community engagement; and use of innovative technologies. Barberg emphasizes the importance of patient assessment and the development of a therapy plan tailored to the individual's need. He suggests that the medical and social care should be coordinated by a care manager assigned to each patient. Barberg emphasizes the importance of high-quality therapy delivered in a variety of ways, including via technology, to support the individual at each stage of his or her recovery. Barberg emphasizes that the recovery does not end after a short-term treatment plan or even when MAT is ended. It is, for all practical purposes, lifelong and should include peer recovery support groups and coaches that are initiated during MAT to facilitate transition from treatment to recovery.

Conclusion

The national opioid crisis, which is claiming nearly 200 lives each day and rising, has increased awareness of the importance of early screening for opioid and other substance use disorders and referral for treatment. The sooner an individual begins treatment the more likely he or she will have social and economic supports intact and less likely to become tolerant, dependent, or addicted. The initial step in the treatment of OUD is detoxification or withdrawal management. The approaches that have been the most successful are methadone and buprenorphine, in combination with the treatment of withdrawal symptoms. Withdrawal management is monitored using a validated clinical scale such as the COWS.

Once the individual has successfully completed detoxification, he or she is then transitioned to treatment. The treatment that has shown to be the most effective is MAT. Whether the opioid addiction was to prescription opioids or illicit opioids, both benefit from MAT. There are three primary MAT options for treating OUD: methadone, buprenorphine (with or without naloxone), and naltrexone. Naltrexone once monthly injectable has similar success rates to methadone and buprenorphine; however, buprenorphine and methadone are more widely used. Although buprenorphine may be the safer agent, because of evidence of diversion and higher dropout rate, methadone is the treatment of choice in most settings. In MAT, medication is always accompanied by counseling and behavioral therapies, along with medical, vocational education and other assessment and treatment services. These psychosocial adjuncts not only complement the medication therapies but also continue to support the individual well after completion of medication to offer long-term, community-based support to reduce risk of relapse.

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