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Naloxone and Buprenorphine Treatment for Adolescent Opioid Overdose and Opioid Use Disorder
A Review

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IMPORTANCE The ongoing opioid-related overdose crisis in the US is increasingly affecting adolescents and is exacerbated by the widespread availability of illicitly manufactured fentanyl. Adolescents face significant gaps in care for prevention and treatment of opioid use and opioid-related harms. Regulatory changes have impacted the availability of 2 lifesaving medications, naloxone and buprenorphine. This narrative review summarizes the current knowledge of opioid use, overdoses, and opioid use disorder (OUD) among US adolescents in the context of fentanyl, and reviews the use of naloxone and buprenorphine, for overdose reversal and OUD treatment, respectively.

OBSERVATIONS Owing to their developmental stage, adolescents are uniquely vulnerable to initiating substances, experiencing substance-related harms, and developing substance use disorders. From 2018 through 2023, morbidity and mortality have increased from use of opioids, particularly fentanyl, among youth. Naloxone and buprenorphine are safe and highly effective medications for opioid overdose reversal and OUD treatment, respectively. Regulations for these medications have changed to address the worsening overdose epidemic. Naloxone is approved for over-the-counter sales (including by adolescents younger than 18 years). Any clinician with a US Drug Enforcement Administration–controlled substance license can now prescribe buprenorphine for OUD without a waiver. These policy changes present critical opportunities to save lives and reduce inequities among adolescents.

CONCLUSION AND RELEVANCE Harms from opioids are increasingly affecting adolescents with a notable rise in overdose fatalities in the past 5 years. Regulatory changes for naloxone and buprenorphine have occurred to improve access to both these medications. Despite these changes, adolescents continue to have low access to these life-saving interventions. Ensuring that clinicians have the knowledge to provide both medications to adolescents is a key step to addressing the epidemic of adolescent drug overdoses and reducing opioid-related harms.

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Over the past 2 decades, the US has been experiencing an ongoing opioid-related overdose epidemic with more than 1 million people dying from drug overdose since 2000.[1,2] Adolescents and young adults have not been spared and are increasingly facing worsening morbidity and mortality.[3-5] Overdose is a leading cause of death among adolescents and rates have more than doubled since 2019.[3]

The increasing lethality of the overdose epidemic has been driven largely by the emergence of illicitly manufactured synthetic opioids, including fentanyl and its analogs, which rose to prominence within the drug supply around 2016.[1] Of all adolescent overdose deaths, 90% now involve fentanyl.[3,4] Synthetic opioids transformed the epidemic for adolescents, a group that had previously been less affected until fentanyl became widespread in the drug supply.[6] Synthetic opioids are extremely potent, addictive, and are currently ubiquitous.[6] However, there are life-saving medications that can reverse opioid overdoses, treat opioid use disorder (OUD), and provide overdose protection. National organizations such as the American Academy of Pediatrics, the American Society of Addiction Medicine, and the Society for Adolescent Health and Medicine have endorsed naloxone for the reversal of opioid-related overdoses and recommended medications for the treatment of OUD (MOUDs), such as buprenorphine.[7-10]

Despite these recommendations, significant barriers to access naloxone, buprenorphine, and substance use–related care remain for adolescents. Adolescents at high risk of overdose rarely receive prescriptions for naloxone, and dispensing rates to youth are far below that of adults.[11-13] Systematic reviews consistently find younger age to be negatively associated with MOUD access.[14-16] Indeed, fewer than 1 in 54 youth received MOUD after experiencing a nonfatal overdose.[17] Most residential addiction treatment centers do not accept or provide buprenorphine for adolescents.[18,19]

The US made regulatory changes to expand access to naloxone and buprenorphine in 2023 to address the worsening overdose crisis. Naloxone was approved for over-the-counter sales, include to adolescents, and the waiver requirement to prescribe buprenorphine for OUD

was removed. Early data suggest that these efforts may be having an impact, as for the first time in a decade overdose death has begun to stabilize.[20] Despite these trends, historically, only 5% of adolescents with OUD receive MOUDs and many clinicians feel unprepared to manage overdose risk and OUD among their adolescent patients.[21-23] Further, adolescent overdose deaths in 2023 remained more than twice as high as prepandemic levels.[20] Given the evolving nature of the opioid overdose epidemic, the persistent treatment gap for adolescents, and policy changes surrounding naloxone and buprenorphine, a review of opioid-related overdose, OUD, and the role of these lifesaving medications for adolescents is warranted. The objective of this review is to summarize current knowledge of opioid overdose and OUD and their management with naloxone and buprenorphine among adolescents in the era of synthetic opioids.

Methods

This review was based on searches of PubMed for peer-reviewed English-language articles related to pediatric OUD, overdose reversal, and MOUDs conducted through May 31, 2025. Searches were limited to any study that included adolescents and adults younger than 21 years. Search terms included *fentanyl*, *opioid*, *pediatric*, *adolescent*, *overdose*, *naloxone*, *buprenorphine*, OR *mortality*. There was no limit on the date ranges of reviewed articles. A systematic review was not performed because of the small number of prospective randomized trials involving naloxone or buprenorphine among pediatric populations.[7]

Current Opioid Landscape: Synthetic Opioids

The overdose epidemic dramatically worsened with the proliferation of illicitly manufactured synthetic opioids into the drug supply in the mid- to late 2010s.[6] At this time, the drug supply shifted from heroin to fentanyl, marking the onset of the third wave of the opioid epidemic; the era of fentanyl. Fentanyl and its analogs are potent synthetic opioids. Fentanyl is 50 times more potent than heroin and 100 times more potent than morphine, with some analogs being even more potent.[24,25] Fentanyl has a rapid onset and a short duration of effect as it is quickly redistributed from the brain to fatty tissues. This pattern contrasts with heroin or oxycodone, which have a slower onset and longer duration of action, making fentanyl far more likely to drive rapid tolerance, withdrawal, and repeated use.[6] Yet for individuals with minimal prior opioid exposure, as may be common among adolescents, even low doses can cause fatal respiratory depression.

The fentanyl in the drug supply is illicitly manufactured, inexpensive, and widely available throughout the US.[6] It is commonly manufactured in either in tablet form mimicking prescription pills (eg, oxycodone or alprazolam) or produced as a powder.[25] Counterfeit pills contain a range of fentanyl varying from trace amounts to up twice the lethal dose; in 2023, as many as 70% of counterfeit pills contained potentially deadly doses of the drug.[26,27] In many areas of the US, xylazine (a potent α2 agonist) is added to fentanyl products to potentiate sedating effects.[28] There is also increasing use with other substances, such as cocaine or methamphetamine.[29] Notably, the US has entered a fourth wave of the overdose epidemic defined by increasing mortality associated with the course of stimulants (eg, cocaine and methamphetamine) and synthetic opioids.[29]

Adolescents, Opioids, and Fentanyl

Adolescents experienced a near doubling in overdose deaths from 2019 to 2020, with a near quadrupling of overdoses involving fentanyl and other synthetic opioids.[3,4] By the end of 2023, there was a stabilization in overdose deaths among adolescents but mortality remained more than twice as high as 2019 levels.[30] Notably, the proportion of overdose deaths involving fentanyl increased more rapidly among adolescents than adults, highlighting the particular vulnerability of youth to fentanyl.[30] Additionally, 712 000 adolescents and young adults (or approximately 1 in 80) were estimated to have had an OUD in 2023.[31]

Owing to key neurologic and social development, adolescence is a time of elevated risk for initiation of substance use and development of substance use disorders (SUDs).[32] The reward center in the brain matures prior to adolescence, leaving adolescents primed to seek highly stimulating rewards and can result in risk-taking behavior. However, the prefrontal cortex, which is responsible for complex executive functions such as impulse regulation and judgement of consequences, matures later during adolescence and into young adulthood.[33] As a result, adolescents are particularly susceptible to experimentation and the impact of substance use. Data suggest adolescents develop SUDs with fewer exposures compared to adults.[33] Fentanyl may pose an even greater risk of developing symptoms of OUD due to its potency. Moreover, the age at initiation of substance use has an inverse association with the lifetime likelihood of developing an SUD.[34] Prefrontal cortex immaturity contributes to a sense of invulnerability in some adolescents, and research[35] shows that youth underestimate the risks of overdose and addiction.

Importantly, not all youth who use substances will develop an SUD. An adolescent may be using drugs infrequently and not have an SUD. Nonetheless, a single fentanyl exposure can be associated with overdose, unintentional poisoning, or death.[26] Additionally, widespread fentanyl contamination within the drug supply means a youth may take a pill from a dealer or friend that they believe is for anxiety, only for it to be a counterfeit and contain fentanyl.[25] Indeed, among overdoses fatalities in 2021, only one-third of adolescent decedents had known prior opioid use.[36] Most deaths occurred at home with a bystander present but often in a different room or unaware that the adolescent had used substances. Moreover, adolescents were the least likely of all age groups to receive naloxone, the overdose reversal agent.[36] Approaches to naloxone distribution that have been successful in adults may not generalize to adolescents who often overdose with little or no prior opioid use and occur in settings where the need for naloxone is not recognized. This highlights the need for strategies tailored to adolescents and the importance of distributing naloxone broadly to youth, including those who have high-risk nonopioid substance use or have peers or family members who use substances.

Opioid Overdose

Clinical Presentation

An individual who has overdosed on opioids may be unresponsive; have slow, shallow, or absent breathing; produce snoring or gurgling sounds; and have pinpoint pupils. They may be pale or have

cyanosis surrounding their lips or in their extremities. An overdose can become fatal within minutes if not reversed with naloxone.

Opioid Reversal Agent: Naloxone

Naloxone is an opioid antagonist that has a high affinity for opioid receptors. It acts by displacing any opioids occupying receptors, reversing respiratory suppression. It has an effect within 3 to 5 minutes and lasts for 30 to 90 minutes. Naloxone is typically only effective for addressing opioid overdoses, although some anecdotal data suggest it may also be partially supportive in overdoses involving xylazine.[37] Naloxone does not reverse the effects of other sedatives, such as benzodiazepines or alcohol. Naloxone is not a controlled substance, does not have misuse potential, does not need to have doses adjusted for age or medical comorbidities, and has no known adverse effects.[38,39] Naloxone can precipitate withdrawal in individuals with frequent opioid use. Increased access to naloxone has been associated with decreased overdose mortality and has not been shown to increase opioid misuse.[40,41] Intranasal naloxone was authorized to be available over the counter and became available to consumers in the fall of 2023.

Treatment

If an opioid overdose is suspected, a bystander should immediately call emergency medical services and administer naloxone, if available. Naloxone may take up to 3 to 5 minutes for its full effect. Rescue breaths and cardiopulmonary resuscitation should be provided as needed after naloxone is administered. If the individual is still not breathing after the first naloxone administration of 4 mg (the typical dose), a second dose should be provided after 2 to 3 minutes. Most opioid overdoses respond after a single 4-mg dose of naloxone.[42-44] However, if fentanyl or another potent synthetic opioid was used, a second dose may be necessary in some cases. Administration of naloxone for individuals with opioid dependence can precipitate withdrawal symptoms.[43] Naloxone is safe to administer even if it is unclear whether an individual has an opioid overdose.[43] Since overdose symptoms can mimic other medical emergencies, bystanders should call 911 for definitive care.

Overdose Prevention

Clinicians should provide education to youth and families on identifying overdose and provide naloxone to individuals who are prescribed an opioid, use illicit substances, or are around people who use drugs. In addition, clinicians should highlight additional ways overdoses can be prevented and harms reduced (**Table 1**).

Table 1. Overdose Prevention Strategies

Approach	Clinical recommendation
Overdose awareness and education	Inform about the risks of overdose and how to recognize and respond to an opioid overdose.
Overdose reversal agent	Prescribe or provide naloxone to youth or families/peers of individuals who are using substances. Emphasize importance of always carrying naloxone; train on proper administration.
Do not use alone	Emphasize having an individual around who can respond to an overdose or discuss virtual alternatives if necessary, such as never use alone hotline.
Test product for fentanyl	Consider providing fentanyl test strips and/or educate youth how to use them and explain limitations of test strips (ie, detect presence of only part of substance you test; does not measure concentration).
Low, slow, and staggered use	Use a small amount of product and wait sufficient time before increasing amount, especially with a new supply. When using with another individual, space out timing of use to observe for overdose.
Source of product	Explain increased dangers of product from unfamiliar sources, unknown potency, and adulterants. Counterfeit pills often contain variable fentanyl amounts.
Route of administration	Educate on relative risks of different routes of administration (ie, pills vs snorting vs smoking vs injection). Advise on ways to reduce risk or modify route.
Activities around use	Advise against mixing substances and using before/during high-risk activities (eg, swimming and driving). Surroundings around use impact safety.

Opioid Use Disorder

Clinical Presentation

OUD is defined as the use of opioids (either prescription or illicit opioids) in a manner that becomes compulsive and continues despite negative consequences. An individual may also develop tolerance to opioids (ie, the need for escalating doses) and physical dependence (withdrawal symptoms when not using).[45] OUD is a chronic treatable disease diagnosed using *Diagnostic Statistical Manual of Mental Disorders 5* (*DSM-5*) criteria (**Table 2**). There are 11 clinical criteria in relation to opioid use over the past 12 months, and the severity of OUD is based on the number of criteria exhibited. The term *addiction* typically refers to moderate to severe OUD.

Medication for Opioid Use Disorder

There are 3 different medications used to treat OUD: naltrexone (opioid antagonist), buprenorphine (partial opioid agonist), and methadone (full opioid agonist). In 2023, the Drug Enforcement Administration removed the requirement for special certification to dispense buprenorphine in a registration known as the X Waiver. This regulatory change was made to expand access to buprenorphine. Now anyone with a standard Drug Enforcement Administration license can prescribe buprenorphine. Buprenorphine is the medication most used in youth and the only MOUD that is US Food and Drug Administration–approved for adolescents aged 16 years and older. However, it is often used off label in younger adolescents.[46] Given this regulatory change and buprenorphine's central role in adolescent treatment, this review focuses on the use of buprenorphine in adolescents.

Buprenorphine

Buprenorphine reduces cravings, decreases withdrawal symptoms, and blunts the effects of other opioids, including fentanyl. Buprenorphine is a high-affinity partial agonist of the opioid receptors. It binds more strongly than other opioids and displaces them if already occupying the receptor. Buprenorphine does not produce severe respiratory suppression, so unlike other opioids, high doses of buprenorphine are not associated with elevated risk for overdose (unless mixed with other sedating substances).[47] Additionally, if an individual's receptors are saturated with buprenorphine and they use additional opioids (eg, fentanyl), they are more protected from overdose than if buprenorphine were not present.[47,48] These combined properties result in the clear survival advantage that buprenorphine confers to people with OUD. Buprenorphine has been shown to decrease mortality by 50%.[48] It also increases retention in treatment with both pharmacotherapy and counseling, decreases nonprescription opioid use, and improves other health outcomes.[48]

Table 2. *DSM-5* Clinical Diagnostic Criteria for Opioid Use Disorder

	Criteria
1	Opioids are often taken in larger amounts or over a longer period than was intended.
2	There is a persistent desire or unsuccessful effort 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	Cravings or a strong desire 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 resulting in a failure to fulfill major role obligations at work, school, or home.
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 use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by opioids.
10	Tolerance[a] as defined by either of the following: Need for markedly increased amounts of opioids to achieve intoxication or desired effect. Markedly diminished effect with continued use of the same amount of opioid.
11	Withdrawal[a] as manifested by either of the following: Characteristic opioid withdrawal syndrome. The same (or closely related) substance use are taken to relieve or avoid withdrawal symptoms.
Summary	The presence of at least 2 symptoms indicates an opioid use disorder. The severity of opioid use disorder is defined as mild: presence of 2-3 criteria, moderate: presence of 4 to 5 symptoms, and severe: presence of 6 or more symptoms.

Abbreviation: *DSM-5*, *Diagnostic and Statistical Manual of Mental Disorders* (*Fifth Edition*).

[a] Individuals who are prescribed opioid medications for analgesia may exhibit these 2 criteria (withdrawal and tolerance) but would not be considered to have an OUD.

Table 3. Clinical Opioid Withdrawal Scale[a]

Symptom	Scale
Resting pulse rate: ___ beats/min, measured after patient is sitting or lying for 1 minute	0: Pulse rate ≤80 1: Pulse rate 81-100 2: Pulse rate 101-120 4: Pulse rate >120
GI upset: over the last half hour	0: No GI symptoms 1: Stomach cramps 2: Nausea or loose stools 3: Vomiting or diarrhea 5: Multiple episodes of diarrhea or vomiting
Sweating: over past half hour not accounted for by room temperature or patient activity	0: No report of chills or flushing 1: Subjective report of chills or flushing 2: Flushed or observable moistness on face 3: Beads of sweat on brow or face 4: Sweat streaming off face
Tremor: observation of outstretched hands	0: No tremor 1: Tremor can be felt but not observed 2: Slight tremor observable 4: Gross tremor or muscle twitching
Restlessness: observation during assessment	0: Able to sit still 1: Reports difficulty sitting still but is able to do so 3: Frequent shifting or extraneous movements of legs/arms 5: Unable to sit still for more than a few seconds
Yawning: observation during assessment	0: No yawning 1: Yawning once or twice during assessment 2: Yawning three or more times during assessment 4: Yawning several times/min
Pupil size	0: Pupils pinned or normal size for room light 1: Pupils possibly larger than normal for room light 2: Pupils moderately dilated 5: Pupils so dilated that only the rim of the iris is visible
Anxiety or irritability	0: None 1: Patient reports increasing irritability or anxiousness 2: Patient obviously irritable/anxious 4: Patient so irritable or anxious that participation in the assessment is difficult
Bone or joint aches: if patient was having pain previously, only the additional component attributed to opiates withdrawal is scored	0: Not present 1: Mild diffuse discomfort 2: Patient reports severe diffuse aching of joints/muscles 4: Patient is rubbing joints or muscles and is unable to sit still because of discomfort
Gooseflesh skin	0: Skin is smooth 3: Piloerection of skin can be felt or hairs standing up on arms 5: Prominent piloerection
Runny nose or tearing: not accounted for by cold symptoms or allergies	0: Not present 1: Nasal stuffiness or unusually moist eyes 2: Nose running or tearing 4: Nose constantly running or tears streaming down cheeks

Abbreviation: GI, gastrointestinal.

[a] The total score is the sum of all 11 items. Score: 5-12 = mild; 13-24 = moderate; 25-35 = moderately severe; >36 = severe withdrawal.

Treatment

Initiation or Induction of Buprenorphine

Starting treatment with buprenorphine occurs in individuals with opioid dependence when they develop withdrawal symptoms to avoid causing iatrogenic withdrawal. Buprenorphine's strong affinity for the μ opioid receptor can precipitate acute withdrawal as the full agonist opioid is displaced with the partial agonist that is not stimulating the receptor as fully.[49] Precipitated withdrawal is very uncomfortable and highly distressing. For this reason, it is important to try to wait until a patient is in at least moderate withdrawal prior to starting buprenorphine. Withdrawal symptoms can be scored using the Clinical Opioid Withdrawal Scale (**Table 3**). Buprenorphine induction should not occur until a patient attains a Clinical Opioid Withdrawal Scale score of 8 or higher.

The timing of withdrawal symptom onset is dependent upon the opioid the individual was taking; short-acting opioids (eg, heroin) typically require 6 to 12 hours since last use; long-acting opioids (eg, extended-release oxycodone), 12 to 24 hours; and methadone, 48 to 72 hours since last use.[50,51] Individuals using fentanyl may be at elevated risk of experiencing precipitated withdrawal due to the lipophilic nature of fentanyl.[49,52] Therefore, experts recommend waiting at least 12 to 24 hours since last use of fentanyl and higher Clinical Opioid Withdrawal Scale score. The more severe withdrawal that a patient can tolerate, the lower the risk of precipitated withdrawal.[53] However, because opioid withdrawal is extremely uncomfortable and delay in buprenorphine may lead to a return to opioid use, clinicians should engage patients in a shared decision-making process around timing of induction and risk of precipitated withdrawal. This approach allows collaboration and helps patients

Table 4. Supportive Medications During Buprenorphine Induction for Individuals With Opioid Dependence Experiencing Withdrawal

Withdrawal symptom	Supportive medication
Nausea and vomiting	Ondansetron
Diarrhea	Loperamide
Myalgias/pain	Acetaminophen, ibuprofen
Anxiety related to withdrawal	Hydroxyzine, clonidine
Insomnia	Melatonin
Autonomic symptoms	Clonidine

Table 5. Formulations of Buprenorphine for Treating Opioid Use Disorder[a]

Formulation	Name	Dosage forms
Short-acting: daily		
Buprenorphine tablet	Generic	Sublingual 2 mg, 8 mg
	Subutex	Sublingual 2 mg, 8 mg
Buprenorphine/naloxone tablet	Generic	Sublingual 2/0.5 mg, 8/2 mg
	Zubsolv	Sublingual tablet 0.7/0.18 mg, 1.4/0.36 mg, 2.9/0.71 mg, 5.7/1.4 mg, 8.6/2.1 mg, 11.4/2.9 mg
Buprenorphine/naloxone film	Generic	Sublingual film 2/0.5 mg, 8/2 mg
	Suboxone	Sublingual film 2/0.5 mg, 8/2 mg
Long-acting: weekly or monthly		
Buprenorphine	Sublocade	Subcutaneous injection, monthly: 100 mg, 300 mg
	Brixadi	Subcutaneous injection: weekly: 8 mg, 16 mg, 24 mg, 32 mg; monthly: 64 mg, 96 mg, 128 mg

[a] There are other formulations of buprenorphine that are approved for the treatment of pain that are not listed. They are available as transdermal patches, buccal films, and short-acting injections. Buprenorphine for pain is low dose and contains <2 mg of buprenorphine.

make informed choices around their comfort and safety. Additionally, clinicians should support patients through initial withdrawal symptoms prior to buprenorphine initiation by prescribing comfort medications for withdrawal symptoms (**Table 4**).

The goal of the first day of treatment with buprenorphine is to treat withdrawal symptoms and help an individual feel comfortable. Buprenorphine can be initiated in emergency departments, inpatient units, outpatient clinics, and at home.[54-56] It is imperative that if an adolescent is looking to initiate buprenorphine, they start as soon as possible since delays in treatment are associated with decreased engagement in care.[57] After initiation, subsequent days are focused on eliminating withdrawal symptoms and reducing cravings. Buprenorphine can be increased to reduce cravings or decreased to reduce side effects. Buprenorphine has a long duration of action and can be dosed every 24 hours. Many patients choose to split their daily dose into twice-daily portions to provide consistent coverage and reduce mild withdrawal symptoms as their dose wears off. Traditional total daily doses of buprenorphine range from 16 mg to 24 mg. However, some adolescents may need lower doses (eg, 8 mg) due to shorter use histories compared to adults. Conversely, if a youth is using a lot of fentanyl daily, they may require daily doses as high as 24 mg. Common adverse effects include sedation, headache, and constipation. For youth who do not wish to take daily medication and are taking 8 mg per 24-hour period or more, injectable long-acting buprenorphine is an option. Formulations and typical doses of buprenorphine are listed in **Table 5**.

Buprenorphine is also effective for individuals with more distant opioid use who are no longer experiencing withdrawal but are having cravings for opioids, which commonly persist for months or even years after last use.[58] Buprenorphine may be started at lower doses (1 to 2 mg) in these individuals and slowly increased over time.[59] There are many resources for induction protocols through organizations such as the Substance Abuse and Mental Health Services Administration and the American Society of Addiction Medicine.[51,60,61] The Providers Clinical Support System also provides education and mentorship for clinicians who want to improve their treatment of OUD.[62]

Laboratory Testing

There is no required laboratory work needed to start buprenorphine. However, baseline liver function, pregnancy tests, human immunodeficiency virus, viral hepatitis, and sexually transmitted infection screens should be considered based on history and risk factors. Urine toxicology testing is often obtained throughout treatment to assess for continued opioid use and to monitor patients' adherence to buprenorphine. The frequency of testing is practice dependent and based on the individual needs of the patient. As OUD is a chronic disease, recurrence often occurs during recovery. Buprenorphine should be adjusted rather than discontinued if opioids appear on toxicology screens during treatment. Indeed, discontinuing buprenorphine in someone who experiences a recurrence of use may place them at greater risk of worsening opioid use and death. It is important to know what substances are screened at your institution; for example, not all urine toxicology tests check for fentanyl.

Treatment Duration

There are limited data on optimal treatment duration for adolescents taking MOUDs. Studies suggest that longer durations (ie, at least several months and often at least 1 year) are associated with better treatment retention, lower rates of intravenous drug use, and fewer positive drug screen results compared to quick tapers from buprenorphine (ie, over 1 to 2 weeks).[63,64] Data from adults confirm that longer durations (ie, 2 to 3 years) are associated with better outcomes.[48] When an individual wants to discontinue treatment, buprenorphine should be tapered off to avoid withdrawal. Tapering regimens should not lower buprenorphine by more than 2 to 4 mg weekly, and the final 2 mg may take longer to taper off.[64] Clinicians should ensure buprenorphine tapers are closely monitored for signs of withdrawal and cravings.

Harm Reduction

Harm reduction is a set of strategies to reduce the risk of adverse consequences from substance use.[65] Harm reduction improves recovery outcomes and save lives.[66-68] Abstinence is not a realistic goal for everyone, and keeping youth safe and healthy is key. Harm-reduction strategies engage youth so that when they are ready to receive treatment, they have a trusted clinician they can turn to. Key strategies include both overdose prevention strategies as well as strategies to reduce consequences related to use (Table 1).

Behavioral Health Support

Clinicians should offer referrals for psychotherapy, recovery supports, and other behavioral health services. However, these should

not be required as a precondition for receiving MOUD, which confers a survival benefit even when patients do not engage in behavioral health services.[69,70] Treatment with MOUD is associated with greater engagement with behavioral health services.[48]

Adolescent Considerations for OUD Treatment

Engagement and Retention in Care

Adolescents seek treatment for substance use at low rates. Further among individuals of all ages who seek treatment, youth are less likely to be retained in care.[69] Reluctance to seek care is likely multifactorial. By nature of their age and development, youth may not recognize their substance use as problematic and use may be normalized among peers. There may be fewer consequences from use given shorter use histories.[70] Youth also face limited availability of clinicians and lack of youth-centered treatment.[70-72] Additionally, treatment for youth has often been limited to psychosocial interventions despite extensive evidence for the safety and efficacy of MOUDs.[73]

Confidentiality and Consent

Confidentiality is an essential component of adolescent health care. Adolescents are more likely to engage with health care professionals around high-risk behaviors if their health care is confidential.[74] Health care professionals should detail the limits of confidentiality. Some clinicians may elect to disclose to parents or guardians if an adolescent younger than 18 years is using fentanyl given the high risk of mortality. However, clinicians should partner with adolescents to determine the best strategy for disclosing this information. Approximately half of all states allow minors younger than 18 years to consent for substance use and mental health treatment.[75] Clinicians should familiarize themselves with their state's minor consent laws.

Engagement of Caregivers and Loved Ones

While maintaining adolescent confidentiality is fundamental to OUD care, patients should be encouraged to involve loved ones. Clinicians should include caregivers in treatment whenever possible (with the consent of the adolescent), since family involvement typically improves treatment outcomes.[76] Caregivers are often helpful in navigating the health system, providing transportation to appointments, safely storing and administering medication, and supporting retention in treatment. Family-based interventions may be more effective than other stand-alone nonpharmacologic treatments for youth SUD.[77]

Co-Occurring Conditions

Roughly 60% of youth with OUD or history of nonfatal overdose have co-occurring mental health conditions.[78] The most common co-occurring conditions are anxiety, depression, and posttraumatic stress disorder.[78] Clinicians should screen for depression, anxiety, and posttraumatic stress disorder among all youth with OUD. Unfortunately, there is a paucity of services that integrate mental health and substance use–related care, which contributes to worse health care outcomes. Youth with co-occurring disorders experience elevated rates of relapse.[79] Therefore, it is imperative that youth receive care for both the OUD and the mental health condition. However, OUD care should not be delayed while awaiting mental health treatment.

Conclusions

Adolescent morbidity and mortality have risen sharply with the widespread proliferation of fentanyl. Although safe and effective medications exist that can prevent overdose and treat OUD, their use among youth remained limited. Regulatory changes were designed to expand access to naloxone and buprenorphine, yet substantial gaps in adolescent utilization persist. More research is needed to establish the best practices for treating adolescents with OUD and overdose risk. Nonetheless, there is an urgent need for pediatricians to incorporate these medications into clinical practice. This review aims to support that effort by summarizing the key clinical considerations for using naloxone and buprenorphine in youth during the era of fentanyl.

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