



# Medication-Assisted Treatment of Adolescents With Opioid Use Disorders

COMMITTEE ON SUBSTANCE USE AND PREVENTION

Opioid use disorder is a leading cause of morbidity and mortality among US youth. Effective treatments, both medications and substance use disorder counseling, are available but underused, and access to developmentally appropriate treatment is severely restricted for adolescents and young adults. Resources to disseminate available therapies and to develop new treatments specifically for this age group are needed to save and improve lives of youth with opioid addiction.

## abstract

FREE

## BACKGROUND

With a renewed emphasis on treating pain directed by the US Department of Health and Human Services in 1992<sup>1</sup> and institutionalized by the Joint Commission on Accreditation of Hospitals in 2001,<sup>2</sup> combined with the development of potent oral opioid pain medications, exponential increases in the annual number of opioid prescriptions written by US physicians have occurred over the past 2 decades.<sup>3</sup> Between 1991 and 2012, the rate of “nonmedical use” (ie, use without a prescription or more than prescribed) of opioid medication by adolescents (12–17 years of age) and young adults (18–25 years of age) more than doubled,<sup>4,5</sup> and the rate of opioid use disorders, including heroin addiction, increased in parallel.<sup>6</sup> The rate of fatal opioid overdose more than doubled between 2000 and 2013.<sup>7</sup> In 2008, more than 16 000 people died of opioid pain reliever overdose.<sup>7</sup> Other serious adverse health outcomes result from intravenous drug use and include endocarditis,<sup>8</sup> abscesses,<sup>9</sup> and infection with hepatitis C.<sup>10</sup>

Severe opioid use disorder is a chronic condition in which neurologic changes in the reward center of the brain are responsible for cravings and compulsive substance use.<sup>11</sup> The associated behavioral disruptions and change in functioning range from modest to severe; remarkably, some adolescents may continue to do well in school and in other areas of life despite severe opioid use disorder. The rate of spontaneous remission is low; however, patients can recover. Three medications are currently indicated for treating severe opioid use disorder: methadone,

*This document is copyrighted and is property of the American Academy of Pediatrics and its Board of Directors. All authors have filed conflict of interest statements with the American Academy of Pediatrics. Any conflicts have been resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has neither solicited nor accepted any commercial involvement in the development of the content of this publication.*

*Policy statements from the American Academy of Pediatrics benefit from expertise and resources of liaisons and internal (AAP) and external reviewers. However, policy statements from the American Academy of Pediatrics may not reflect the views of the liaisons or the organizations or government agencies that they represent.*

*The guidance in this statement does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.*

*All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.*

**DOI:** 10.1542/peds.2016-1893

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2016 by the American Academy of Pediatrics

**FINANCIAL DISCLOSURE:** The authors have indicated they do not have a financial relationship relevant to this article to disclose.

**FUNDING:** No external funding.

**POTENTIAL CONFLICT OF INTEREST:** The authors have indicated they have no potential conflicts of interest to disclose.

**To cite:** AAP COMMITTEE ON SUBSTANCE USE AND PREVENTION. Medication-Assisted Treatment of Adolescents With Opioid Use Disorders. *Pediatrics*. 2016;138(3):e20161893

naltrexone, and buprenorphine. Methadone, a full opioid agonist with a long half-life that can ameliorate the cycle of intense euphoria followed by intense withdrawal associated with opioid use, has long been established as an effective treatment of opioid addiction, although federal regulations prohibit most methadone programs from admitting patients younger than 18 years. In 2000, the US Congress passed the Drug Addiction Treatment Act, which allows for physicians to complete 8 hours of training and apply for a waiver to prescribe buprenorphine, a partial opioid agonist, to treat opioid use disorders in general medical settings.<sup>12</sup> Naltrexone, an opioid antagonist with high affinity for the opioid receptor, has also proven to be an effective treatment of opioid addiction. Unlike opioid agonists, naltrexone has a very limited potential for misuse or diversion. The extended-release formulation may reduce patient adherence burden. Although there is not yet rigorous research support for efficacy in adolescents, growing experience and anecdotal reports support it as a promising practice. Naltrexone, which also reduces alcohol cravings, may be a good therapeutic option for adolescents and young adults with co-occurring alcohol use disorder, as well as those living in unstable or unsupervised housing.

In 2002, the US Food and Drug Administration approved the use of buprenorphine for patients 16 years and older.<sup>13</sup> Buprenorphine is a partial opioid agonist with high affinity for the opioid receptor. Buprenorphine binding results in gentle stimulation of the opioid system, which, like methadone, can ameliorate the highs and lows associated with full agonists with short and moderate half-lives. An expansive body of research has shown the effectiveness of buprenorphine for treating adults with opioid use disorders,<sup>14</sup> and

2 randomized controlled trials have examined the therapeutic efficacy of buprenorphine combined with substance use counseling in adolescents and young adults. Marsch et al<sup>15</sup> found that adolescents 13 to 18 years of age who received 2 weeks of buprenorphine treatment were more likely to continue medical care compared with those who received clonidine for the same period of time. A trial conducted by Woody et al<sup>16</sup> compared 2 detoxification regimens among adolescents and young adults 15 to 21 years of age. One group received 8 weeks of buprenorphine before tapering, and the second group received 2 weeks. Adolescents who received 8 weeks had lower rates of illicit opioid use while they were taking buprenorphine, and the differences quickly disappeared once the medication was discontinued. The findings led the authors to conclude that there is no obvious reason to stop medications in adolescent patients who are doing well on buprenorphine. Matson et al<sup>17</sup> found that continued buprenorphine compliance is associated with an increase in treatment and can help adolescents achieve long-term sobriety. In general, youth have lower rates of treatment retention compared with adults,<sup>18–20</sup> underscoring the need to deliver developmentally appropriate treatment to achieve best outcomes.

Buprenorphine has the potential for misuse and diversion because of its opioid agonist activity, although its “addiction potential” is thought to be much lower than that of full opioid agonists, such as oxycodone or heroin. Extensive experience with adults has established the evidence supporting the efficacy of buprenorphine, and although not as well studied among youth so far, research and clinical experience to date have not identified any age-specific safety concerns. Nonetheless, confusion, stigma, and limited resources severely restrict

access to buprenorphine for both adolescents and adults. Knudsen et al<sup>21</sup> found that less than 50% of a nationally representative sample of 345 addiction treatment programs serving adolescents and adults offer patients medication for the treatment of opioid use disorders, and even among programs that do offer it, medication is significantly underutilized. The same study found that only 34% of opioid-dependent patients in treatment receive medication. By comparison, 70% of patients with mental health disorders in these same programs received medication. Policies, attitudes, and messages that serve to prevent patients from accessing a medication that can effectively treat a life-threatening condition may be harmful to adolescent health.

## RECOMMENDATIONS

1. Opioid addiction is a chronic relapsing neurologic disorder. Although rates of spontaneous recovery are low, outcomes can be improved with medication-assisted treatment. The American Academy of Pediatrics (AAP) advocates for increasing resources to improve access to medication-assisted treatment of opioid-addicted adolescents and young adults. This recommendation includes both increasing resources for medication-assisted treatment within primary care and access to developmentally appropriate substance use disorder counseling in community settings. Pediatricians have access to an AAP-endorsed buprenorphine waiver course at [www.aap.org/mat](http://www.aap.org/mat).
2. The AAP recommends that pediatricians consider offering medication-assisted treatment to their adolescent and young adult patients with severe opioid use disorders or discuss referrals to other providers for this service.

3. The AAP supports further research focus on developmentally appropriate treatment of substance use disorders in adolescents and young adults, including primary and secondary prevention, behavioral interventions, and medication treatment.

#### LEAD AUTHORS

Sharon Levy, MD, MPH, FAAP

#### COMMITTEE ON SUBSTANCE USE AND PREVENTION, 2015–2016

Sheryl A. Ryan, MD, FAAP, Chairperson  
 Pamela K. Gonzalez, MD, FAAP  
 Stephen W. Patrick, MD, MPH, MS, FAAP  
 Joanna Quigley, MD, FAAP  
 Lorena Siqueira, MD, MSPH, FAAP  
 Leslie R. Walker, MD, FAAP

#### FORMER COMMITTEE MEMBER

Sharon Levy, MD, MPH, FAAP

#### LIAISONS

Vivian B. Faden, PhD – *National Institute of Alcohol Abuse and Alcoholism*  
 Gregory Tau, MD, PhD – *American Academy of Child and Adolescent Psychiatry*

#### STAFF

Renee Jarrett, MPH

#### ABBREVIATION

AAP: American Academy of Pediatrics

#### REFERENCES

1. Agency for Health Care Policy and Research Public Health Service. Acute pain management: operative or medical procedures and trauma (clinical practice guideline). Rockville, MD: Agency for Health Care Policy and Research; 1992. Available at: <http://archive.ahrq.gov/clinic/medtep/acute.htm>. Accessed November 11, 2014
2. The Joint Commission. Pain Management Fact Sheet. 2014. Available at: [www.jointcommission.org/topics/pain\\_management.aspx](http://www.jointcommission.org/topics/pain_management.aspx). Accessed November 10, 2014

3. Volkow ND. America's addiction to opioids: heroin and prescription drug abuse. National Institute on Drug Abuse; May 14, 2014. Available at: [www.drugabuse.gov/about-nida/legislative-activities/testimony-to-congress/2014/americas-addiction-to-opioids-heroin-prescription-drug-abuse](http://www.drugabuse.gov/about-nida/legislative-activities/testimony-to-congress/2014/americas-addiction-to-opioids-heroin-prescription-drug-abuse). Accessed September 12, 2014
4. Substance Abuse and Mental Health Services Administration Office of Applied Studies. National Household Survey on Drug Abuse: Population Estimates 1992. Rockville, MD: Substance Abuse and Mental Health Services Administration; 1993. Available at: <https://babel.hathitrust.org/cgi/pt?id=mdp.39015026207988;view=1up;seq=89>. Accessed March 1, 2016
5. Substance Abuse and Mental Health Services Administration. *Results From the 2012 National Survey on Drug Use and Health: Summary of National Findings*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2013
6. Muhuri PK, Gfroerer JC, Davies MC. Associations of nonmedical pain reliever use and initiation of heroin use in the United States. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2013. Available at: [www.samhsa.gov/data/sites/default/files/DR006/DR006/nonmedical-pain-reliever-use-2013.htm](http://www.samhsa.gov/data/sites/default/files/DR006/DR006/nonmedical-pain-reliever-use-2013.htm). Accessed November 5, 2014
7. Hedegaard H, Chen L-H, Warner M. Drug-poisoning deaths involving heroin: United States, 2000–2013. Hyattsville, MD: Centers for Disease Control and Prevention; 2015. Available at: [www.cdc.gov/nchs/data/databriefs/db190.htm](http://www.cdc.gov/nchs/data/databriefs/db190.htm). Accessed October 26, 2015
8. Moss R, Munt B. Injection drug use and right sided endocarditis. *Heart*. 2003;89(5):577–581. Available at: <http://heart.bmj.com/content/89/5/577.short>. Accessed October 26, 2015
9. Summanen PH, Talan DA, Strong C, et al. Bacteriology of skin and soft-tissue infections: comparison of infections in intravenous drug users and individuals with no history of intravenous drug use. *Clin Infect Dis*. 1995;20(suppl 2):S279–S282. Available at: <http://cid.oxfordjournals.org/content/20/>

Supplement\_2/S279.short. Accessed October 26, 2015

10. Tsui JI, Evans JL, Lum PJ, Hahn JA, Page K. Association of opioid agonist therapy with lower incidence of hepatitis C virus infection in young adult injection drug users. *JAMA Intern Med*. 2014;174(12):1974–1981. Available at: [www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4506774&tool=pmcentrez&rendertype=abstract](http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4506774&tool=pmcentrez&rendertype=abstract). Accessed October 26, 2015
11. Kosten TR, George TP. The neurobiology of opioid dependence: implications for treatment. *Sci Pract Perspect*. 2002;1(1):13–20. Available at: [www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2851054&tool=pmcentrez&rendertype=abstract](http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2851054&tool=pmcentrez&rendertype=abstract). Accessed November 10, 2014
12. Substance Abuse and Mental Health Services Administration. Drug Addiction Treatment Act of 2000: Title XXXV, Section 3502 of the Children's Health Act of 2000. 2014. Available at: <http://buprenorphine.samhsa.gov/titlexxxv.html>. Accessed November 12, 2014
13. McCormick C. *Suboxone and Subtex Approval Letter*, vol. 732. Rockville, MD: Center for Drug Evaluation and Research; Food and Drug Administration; 2002
14. Kraus ML, Alford DP, Kotz MM, et al; American Society of Addiction Medicine. Statement of the American Society of Addiction Medicine Consensus Panel on the use of buprenorphine in office-based treatment of opioid addiction. *J Addict Med*. 2011;5(4):254–263. Available at: [www.ncbi.nlm.nih.gov/pubmed/22042215](http://www.ncbi.nlm.nih.gov/pubmed/22042215). Accessed November 11, 2014
15. Marsch LA, Bickel WK, Badger GJ, et al. Comparison of pharmacological treatments for opioid-dependent adolescents: a randomized controlled trial. *Arch Gen Psychiatry*. 2005;62(10):1157–1164
16. Woody GE, Poole SA, Subramaniam G, et al. Extended vs short-term buprenorphine-naloxone for treatment of opioid-addicted youth: a randomized trial. *JAMA*. 2008;300(17):2003–2011. Available at: [www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2610690&](http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2610690&)

tool=pmcentrez&rendertype=abstract.  
Accessed June 20, 2014

17. Matson SC, Hobson G, Abdel-Rasoul M, Bonny AE. A retrospective study of retention of opioid-dependent adolescents and young adults in an outpatient buprenorphine/naloxone clinic. *J Addict Med.* 2014;8(3):176–182
18. Schuman-Olivier Z, Weiss RD, Hoepfner BB, Borodovsky J, Albanese MJ. Emerging adult age status predicts poor buprenorphine treatment retention. *J Subst Abuse Treat.* 2014;47(3):202–212
19. Dreifuss JA, Griffin ML, Frost K, et al. Patient characteristics associated with buprenorphine/naloxone treatment outcome for prescription opioid dependence: Results from a multisite study. *Drug Alcohol Depend.* 2013;131(1–2):112–118
20. Marsch LA, Stephens MAC, Mudric T, Strain EC, Bigelow GE, Johnson RE. Predictors of outcome in LAAM, buprenorphine, and methadone treatment for opioid dependence. *Exp Clin Psychopharmacol.* 2005;13(4):293–302
21. Knudsen HK, Abraham AJ, Roman PM. Adoption and implementation of medications in addiction treatment programs. *J Addict Med.* 2011;5(1):21–27. Available at: [www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3045214&tool=pmcentrez&rendertype=abstract](http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3045214&tool=pmcentrez&rendertype=abstract). Accessed October 30, 2014

**Medication-Assisted Treatment of Adolescents With Opioid Use Disorders**  
COMMITTEE ON SUBSTANCE USE AND PREVENTION  
*Pediatrics* originally published online August 22, 2016;

**Updated Information & Services**

including high resolution figures, can be found at:  
<http://pediatrics.aappublications.org/content/early/2016/08/18/peds.2016-1893>

**References**

This article cites 12 articles, 1 of which you can access for free at:  
<http://pediatrics.aappublications.org/content/early/2016/08/18/peds.2016-1893#BIBL>

**Subspecialty Collections**

This article, along with others on similar topics, appears in the following collection(s):

**Substance Use**

[http://www.aappublications.org/cgi/collection/substance\\_abuse\\_sub](http://www.aappublications.org/cgi/collection/substance_abuse_sub)

**Permissions & Licensing**

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:

<http://www.aappublications.org/site/misc/Permissions.xhtml>

**Reprints**

Information about ordering reprints can be found online:

<http://www.aappublications.org/site/misc/reprints.xhtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®



# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

**Medication-Assisted Treatment of Adolescents With Opioid Use Disorders**  
COMMITTEE ON SUBSTANCE USE AND PREVENTION  
*Pediatrics* originally published online August 22, 2016;

The online version of this article, along with updated information and services, is  
located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/early/2016/08/18/peds.2016-1893>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 345 Park Avenue, Itasca, Illinois, 60143. Copyright © 2016 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

