

Policy Statement:

Reducing Opioid Prescribing by Oral Health Professionals **Association of State and Territorial Dental Directors**

Approved September 2021

Summary

The increased prescription of opioids since the 1990s has resulted in a public health epidemic with serious impacts for society as well as for individual and family social and economic well-being. The economic and social burdens of prescription opioid abuse are interrelated and include healthcare costs, loss of productivity, treatment of substance uses, criminal justice involvement, unnecessary deaths, and other costs. Prescription practices by health professionals for dental pain have contributed to the opioid abuse epidemic in the United States. Opioids are prescribed by medical providers to patients presenting in hospital emergency departments and by dentists in dental care settings. Opioid prescribing rates in the U.S. can be attributed to lack of definitive dental treatments in emergency departments, pharmaceutical marketing, excess opioid supply, variable understanding and perception of pain management, patient demand and perceived satisfaction with treatment. These prescriptions may not be necessary for the presenting problems; the volume of prescriptions and the dosages prescribed and dispensed contribute to the problem. Dentists have been identified as the second most frequent prescribers of opioids after family physicians.

This ASTDD Policy Statement offers relevant data and highlights policies and strategies that have been implemented to reduce prescription of opioids in oral health care, including the introduction, adoption, and promotion of prescribing guidelines by the Centers for Disease Control and the American Dental Association. Increased requirements by states for dentist participation in Prescription Drug Monitoring Programs, continuing education for oral health professionals related to pain management, and inclusion of prescription and pain management approaches as standards in dental student and dental specialty education also have an impact. Last, state oral health programs have identified and engaged in promising and effective approaches related to opioid prescription practices.

ASTDD supports state and territorial level actions and activities reflecting national policies to reduce opioid prescriptions for dental and oral conditions. State and territorial oral health programs can encourage healthcare provider and public education, resource development, and prescription monitoring. They can encourage healthcare providers to better understand their own prescribing trends through self-monitoring, evaluation of prescribing practices, and understanding and utilization of alternatives to opioids. They can play a critical role in interdisciplinary collaborations to develop and implement effective ways to engage healthcare providers to create change and protect the public.

Problem

Opioids are a class of pain-relieving drugs prescribed by medical and dental professionals. The increased prescription of opioids since the 1990s has resulted in the misuse of these drugs and a public health epidemic with serious impacts for society as well as for individual and family social and economic well-being. The economic and social burdens of prescription opioid abuse are interrelated and include healthcare costs, loss of productivity, treatment of substance use disorders (SUD), criminal justice involvement, unnecessary deaths, and other costs. The Centers for Disease Control and Prevention (CDC) estimates the total economic burden at \$78.5 billion annually.^{1,2} Opioid use for an extended time increases the chance of addiction. With the prescription of excess opioids, there is also a higher probability of misuse, abuse and diversion (the selling or giving away to others).³ *Misuse* is generally explained as “any use outside of prescription parameters, including misunderstanding of instructions, self-medication of sleep, mood, or anxiety symptoms, and compulsive use driven by an opioid use disorder; *abuse* is “a nonspecific term that can refer to use without a prescription, in a way other than prescribed, or for the experience or feelings elicited.”³

Dentists have been identified as the second most frequent prescribers of opioids after family physicians.⁴ A study of a sample of dental patients from 2011 to 2015 showed that more than 50% of cases were over-prescribed or exceeded the recommended days’ supply.⁵ In 2016, U.S. dentists prescribed 37 times more opioids compared to those in the United Kingdom (U.K.), despite both countries having similar patterns of oral disease and standards of care.⁶ Opioids, such as oxycodone, which have higher chances of being abused, are more often prescribed by U.S. dentists. The formulary in the U.K. limits dentists to prescribing dihydrocodeine, a semi-synthetic opioid analgesic, but in the U.S. dentists and medical providers may prescribe the same scheduled drugs, with the result that dentists may choose to prescribe any prescription opioid.⁶ Higher opioid prescribing rates in the U.S. can be attributed to lack of definitive dental treatments in emergency departments, pharmaceutical marketing, excess opioid supply, variable understanding and perception of pain management, patient demand and perceived satisfaction with treatment.^{6,7}

Approximately 25% of teenagers and young adults receive their first opioid prescriptions from dentists, most likely for third molar (wisdom tooth) removal. Reviews of national datasets of privately insured individuals showed that young people in this general age range who were prescribed opioids after wisdom tooth extraction had higher odds of using opioids one year later compared to those who had never received any opioids.^{8,9,10} In a nationally representative sample, prescribing opioids to teenagers before high school graduation was associated with a 33% increase in the risk of future misuse between ages 19 and 23.¹¹ Established research indicates that the adolescent brain is not fully developed until approximately age 25, particularly the area of the brain (i.e., the prefrontal cortex) related to emotional response, self-control and other processes related to perception and judgment. The potential impact of opioid use on perception means that adolescents may be particularly at risk for developing an SUD.^{12,13,14}

About 54% of pills prescribed to patients after third molar extractions remain unused, potentially contributing to misuse, abuse and diversion.¹⁵ The volume of prescriptions and the dosages prescribed and dispensed have contributed to opioid use problems. Data from 2010-2015 for privately insured dental patients showed that approximately 58% of patients were dispensed additional prescriptions even though they had existing dental-related opioid prescriptions available, sometimes from multiple providers and some same-day prescriptions.⁸ Opioids have been prescribed by medical providers to patients presenting in hospital emergency departments (ED) for dental complaints as well as by dentists in dental care settings for acute issues and following certain surgical procedures.

In its guidance on the management of dental pain, CDC cites studies published in 2019 and 2020 that describe characteristics of opioid prescriptions in EDs to teenagers and young adults for dental pain. These studies showed that such prescriptions were found to be associated with “an increased likelihood of persistent or high-risk opioid use;” that about 15% of the ED visits included an opioid prescription, with dental disorders showing the highest prescribing rates; and that 13.6% of visits to non-dental facilities resulted in prescriptions for more than three days of medication.¹⁶

In EDs as well as in dental care settings, opioid prescriptions may not be necessary for the presenting problems; alternatives are effective for controlling pain.¹⁷ Data from an overview of systematic reviews suggested that the use of nonsteroidal medications, and particularly the use of anti-inflammatory drugs (NSAIDs), with or without acetaminophen, presented the most satisfactory balance between benefits (optimizing efficacy) and harms (minimizing adverse events).¹⁸

The number of opioid prescriptions written in the U.S. increased starting in 2006, reaching more than 225 million in 2012 but then declined to 153 million, the lowest in 14 years.¹⁹ This decrease was due to multiple regulatory measures, recommendations, policy and educational initiatives, and guidelines from health professional organizations.^{20,3} These all play a part in managing and reducing opioid overuse.

Method

Policies and strategies implemented to reduce prescription of opioids in oral health care include the introduction, adoption, and promotion of prescribing guidelines by the CDC and the American Dental Association (ADA). Increased requirements by states for dentist participation in Prescription Drug Monitoring Programs (PDMPs), continuing education for oral health professionals related to pain management, and inclusion of prescription and pain management approaches as standards in dental student and dental specialty education also have had an impact. The [American Medical Association](#) maintains a task force to reduce opioid abuse and provides extensive resources including policy statements, background information and updates on topics including PDMPs, pain management

alternatives, medication-assisted treatment, reducing opioid prescriptions, opioid education, and other topics. Finally, state and territorial oral health programs have identified and engaged in promising and effective approaches related to opioid prescription practices, noted in a separate section.

Prescribing Guidelines

CDC offers a summary of treatment recommendations for dental pain that focus on alternatives to opioid analgesics and limiting opioids if used, and also references CDC's Opioid Prescribing Guideline (2016) for chronic pain. The CDC Guideline addresses patient-centered clinical practices with three focus areas:²¹

- Determining when to initiate or continue opioids for chronic pain, including evaluating alternative therapies.
- Opioid selection, dosage, duration, follow-up, and discontinuation.
- Assessing risk and addressing harms of opioid use, including review of PDMP data .

The Guideline provides a table displaying Morphine Milligram Equivalents (MME) for commonly prescribed opioids, and links for resources on clinical guidance on dosage of opioids for treatment of chronic pain.

The ADA has issued two policy statements:²²

- The *Statement on the Use of Opioids in the Treatment of Dental Pain* affirms that “Dentists should consider nonsteroidal anti-inflammatory analgesics as the first-line therapy for acute pain management ... [and] should recognize multimodal pain strategies for management for acute postoperative pain as a means for sparing the need for opioid analgesics.”
- The *Policy on Opioid Prescribing* “supports mandatory continuing education in prescribing opioids and other controlled substances, with an emphasis on preventing drug overdoses, chemical dependency, and diversion” and “statutory limits on opioid dosage and duration of no more than seven days for the treatment of acute pain, consistent with Centers for Disease Control and Prevention evidence-based guidelines.”

The ADA’s policy also supports “dentists registering with and utilizing Prescription Drug Monitoring Programs.” (See additional information below.)

The Dr. Robert Bree Collaborative/Washington State Agency Medical Directors’ Group issued their *Dental Guideline on Prescribing Opioids for Acute Pain Management* in 2017, prompted by recognizing the role that dentists play in opioid prescription and use.²³ Their intent was to produce “an easy-to-use reference to help dentists, oral surgeons, and others follow a set of clinical recommendations and access supporting evidence and resources.” Although some of the material in the Guideline is specific to Washington State,

the document's sections on clinical recommendations and evidence can be a resource for others.²⁴ Among the recommendations are the following:

- “Prescribe non-opioid analgesics as the FIRST line of pain control for dental procedures. Prescribe combinations of non-steroidal anti-inflammatory drugs and acetaminophen following dental procedures where post-operative pain is anticipated, unless there are contraindications.
- If use of an opioid is warranted, follow the CDC guidelines: ‘Clinicians should prescribe the lowest effective dose of immediate-release opioids and should prescribe no greater quantity than needed for the expected duration of pain severe enough to require opioids. Three days or less will often be sufficient; more than seven days will rarely be needed.’
- Prescribe opioids IN COMBINATION with first-line therapy. Avoid multiple acetaminophen-containing preparations concomitantly.
- For adolescents and young adults through 24 years old who are undergoing minor surgical procedures (e.g., third molar extractions), limit opioid prescriptions to 8-12 tablets.”

The American College of Emergency Physicians ([ACEP](#)) issued their *Clinical Policy: Critical Issues Related to Opioids in Adult Patients Presenting to the Emergency Department* in September 2020. With the goal of addressing opioid management in adult patients presenting to the ED, ACEP conducted a systematic literature review to develop evidence-based recommendations to answer several clinical questions and included studies and reports referencing dental pain. Among other questions, the report looks at whether the benefits of prescribing a short course of opioids on discharge from the ED outweigh the potential harms for patients experiencing an acute painful condition. The recommendation (“Level C, based on Class of Evidence III studies or, in the absence of any adequate published literature, based on expert consensus”) is consistent with the CDC Guideline:

Preferentially prescribe nonopioid analgesic therapies (nonpharmacologic and pharmacologic) rather than opioids as the initial treatment of acute pain in patients discharged from the ED. For cases in which opioid medications are deemed necessary, prescribe the lowest effective dose of a short acting opioid for the shortest time indicated.²⁵

State Laws and Regulations and Prescription Drug Monitoring Programs

Prescription Drug Monitoring Programs (PDMPs) started with individual state-issued, multi-copy paper prescription forms provided by the prescribing practitioner to the issuing pharmacy and filed with the state. They have evolved into electronic database systems that track prescriptions of controlled substances and allow access to that information to authorized individuals. CDC defines PDMPs as follows:

A prescription drug monitoring program (PDMP) is an electronic database that tracks controlled substance prescriptions in a state. PDMPs can provide health authorities timely information about prescribing and patient behaviors that contribute to the epidemic and facilitate a nimble and targeted response.²⁶

Several studies suggest that implementation of PDMPs results in a reduction in opioid prescriptions by physicians,^{27,28} but changes in prescription practices by dentists have not been observed as broadly. Results from an analysis looking at 2.7 million prescriptions (using private and Medicaid claims data) written for dental procedures between 2013 and 2018 observed that while prescribing opioids for extractions had declined and effective nonopioid alternatives were available, opioid prescriptions remained a common choice.²⁹ Results from another analysis of all individual claims between 2013 and 2019 from 10 million dental patients enrolled in Medicaid among 13 states found that the number of prescriptions decreased each year, indicating a downward trend in overprescribing. The same analysis suggests that although opioid reduction strategies are well-known, their overall effectiveness has not received the same attention. In this study, the states comprising the sample were not identified, so any strategies used in those states could not be assessed. The authors noted they “cannot say to which degree reductions in both MME and the overall number of prescriptions is due to changes in provider behavior and education or rather state-led reduction programs.” However, they do suggest that PDMP regulations have had a positive impact in reducing overall opioid overdose deaths.³⁰ Both analyses conclude that although the number of opioid prescriptions by dentists has decreased, it is still higher than it should be, given available alternatives.

By facilitating collection, analysis, and reporting of information on prescribing and dispensing of prescription drugs, PDMPs provide nearly real-time information and have become a significant tool at the state level to monitor prescribing and patient behaviors. Prescribers can review patient histories and evaluate their own prescribing decisions.^{31,32} However, although CDC and ADA guidelines promote participation by dentists in PDMP, their use by the dental community has been a challenge at the state and national levels. National data from 2016 showed that only 47% of dentists used PDMPs, although by 2015, they existed in 49 states.^{33,34}

In February 2021, the PDMP Training and Technical Assistance Center (PDMP TTAC) issued its *Summary of 2020 Bills and Regulations Related to PDMPs*, reporting that several states had extended or strengthened PDMP access to specified practitioners, including dentists (in Alaska, Kentucky, Maryland, and Oregon). The PDMP TTAC provides other resources, including reports on mandatory PDMP use and enrollment, among others. These reports do not consistently list dentists, but the states may include them as prescribers without specifically naming them.³⁵

CDC maintains a [webpage](#) on state prescription drug laws with links to related resources: “Prescription Drug Monitoring Programs (PDMPs) – What States Need to Know” is the [CDC’s page](#) providing background

about these programs, with a link to a following [page for providers](#), including additional information such as clinical practice guidelines and another link to an [online training](#) program. The CDC's webpage also provides several state [success stories](#):

- After mandating clinicians to review PDMP data, Ohio and Kentucky saw MME per capita decreases in 85% and 65% of counties respectively, from 2010 to 2015.
- In New York State, starting in 2012, prescribers were required to check the state's PDMP before prescribing opioids. A year later, data showed a 75% decrease in patients seeing multiple prescribers for the same drugs.
- In Oregon, the Oregon Health Authority (OHA) reported that prescription opioid overdose declined 38% between 2006 and 2013 (from 6.6 to 4.5 per 100,000 residents), and the death rate associated with methadone poisoning decreased 58% in those years. Key initiatives included the establishment of a PDMP to track prescriptions of controlled substances; the implementation of prior authorization by Medicaid for methadone doses greater than 100mg/day; education and access of lay persons to provide naloxone in suspected overdose cases; and physician and allied health care trainings about safe and effective pain care. In 2019, OHA continued to promote use of their PDMP, and worked with health systems, insurers, and other partners to increase access to medication assisted treatment and non-pharmaceutical pain care for chronic non-cancer pain.

The [Network for Public Health Law](#) (NPHL) has compiled [laws and policies](#) that states have implemented to put limits on prescribing and dispensing opioids for pain. NPHL noted in February 2021 that the existence of relevant laws increased from ten states in 2016 to 39 by the end of 2019.³⁶ These binding legal restrictions vary from applying only to initial prescriptions to all prescriptions, including specific requirements for minors and allowing exceptions to general limits.

For example, in 2017 the Michigan state legislature enacted a comprehensive [10-bill package](#) to address abuse and diversion issues, covering prescription limits, prescriber responsibilities, and other concerns. That state's Prescription Drug and Opioid Abuse Commission also provides specific [dental prescribing recommendations](#).³⁷ When the NPHL report was compiled, 14 states were identified as imposing limits on the allowable dosage, 16 states had different or additional restrictions for minors, and only one state (Utah) had limits on the dispensing rather than the prescription of opioids. However, despite "widespread adoption" of these laws, the Network suggests, the evidence of their impact on prescribing practices and patient outcomes remains limited.³⁶

States may pass legislation requiring prescribers to sign and transmit electronic prescriptions to pharmacies, known as [E-prescribing](#). E-prescribing reduces medication errors by alerting providers to potential interactions with other medications, integrates prescriptions into the medical record, and prevents diversion and misuse of controlled substance prescriptions by reducing the incidence of prescription theft and forgery. For example, Rhode Island's Department of Health has developed [guidance on e-prescribing](#) for health providers that links to the state's [regulations on pain management](#).

Dental student education, professional continuing education, and other training

One of the claims analyses cited refers to a one-state survey of dentists that found a positive relationship between the prescribing culture of dental residency programs and the subsequent prescribing patterns of the dentists. Despite having received training in drug diversion, accessing their PDMP, and interest in continuing education on assessment of prescription drug abuse and use of monitoring programs, findings also indicated gaps in training and implementation of risk mitigation strategies.³⁸ Dental school curricula have adapted to include instruction in alternative pharmacological approaches for pain management (e.g., prescribing NSAIDs).³⁹ In 2019, the American Dental Education Association (ADEA) conducted a four module survey with all 66 accredited U.S. dental schools. With 70% of the schools participating overall, the survey showed that 87% of the responding schools had implemented or were in the process of making curricular changes in reaction to the opioid epidemic, and 93% were making or had made clinical changes. The adoption of state-specific regulations/mandates and the ADA's Commission on Dental Accreditation (CODA) [Standard 2-24e](#), which requires competency in prescription practices on SUDs, were the two factors that most frequently influenced these changes.⁴⁰

Examples of dental school and other training opportunities include the following:

- A mandatory protocol was established to teach dental students to prescribe NSAIDs as the first-line pain treatment for dental procedures at the University of Minnesota School of Dentistry.³⁹
- The Indian Health Service mandated training for pain and opioid SUD management in 2015 and saw positive results in knowledge, self-efficacy, and attitudes among prescribers when they compared pre- and post-training results.⁴¹
- The University of Maryland School of Dentistry offers a [course](#) related to opioid prescription practices. Called "Proper Pharmacologic Prescribing and Disposal for Dental Practitioners," it is required for students and required for license renewal.⁴² (Note: other states and dental schools offer courses to meet similar requirements.)

Ongoing discussions about the importance of collaboration and coordination with other health providers for integrated patient care and better outcomes include the role of provider education in prescription practices along with increased understanding and effective use of drug monitoring systems. State and territorial oral health programs can work with other state agencies and stakeholders toward their mutual goals of reducing prescription drug overuse and abuse in dental care.

In October 2018, the Substance Use-Disorder Prevention that Promotes Opioid Recovery and Treatment for Patients and Communities Act (the [SUPPORT for Patients and Communities Act](#)), passed by the 115th Congress, was signed into law. It called for the U.S. Food and Drug Administration (FDA) Commissioner to "develop (and periodically update) high-quality, evidence-based opioid analgesic prescribing guidelines

for the indication-specific treatment of acute pain in the areas where such guidelines do not already exist.” The first request for application (RFA) the FDA issued ([RFA-FD-20-029](#)) focused on the management of acute dental pain. A contract was subsequently awarded to the ADA working together with the University of Pittsburgh to develop an evidence-based guideline for the management of acute dental pain and a dissemination and implementation strategy for the guideline, and to evaluate the strategy. ASTDD is collaborating on the project, due to be completed by September 2023.

State and Territorial Oral Health Programs

State oral health programs (SOHP) have reported experiences in their activities related to opioid prescription practices. An October 2017 ASTDD query of state and territorial dental directors about activities and a follow up in May 2020 about priorities, barriers, and promising/effective approaches for their roles related to opioid prescribing included the following (no territories responded):⁴³

Activities

- planning dental and other health provider education initiatives, such as providing continuing education to dentists on managing dental pain.
- collaborating with the health department’s prescription drug/opioid unit on producing a fact sheet to share with dentists.
- working with the health department’s chronic disease program to include dental providers and incorporate oral health messages into their projects.
- working with dental schools to influence curricula and with the oral surgeons’ society to address pain management practices, and to assure that opioid information would be directed toward the entire dental team (not only dentists).
- working with the health department’s alcohol and drug abuse prevention program to disseminate resources to help medical and dental providers comply with new prescribing legislation.

Priorities for SOHP roles

- assessing perceptions of the dental workforce about prescribing practices.
- educating various audiences (the public, policymakers, dental and healthcare professionals) about prescribing guidelines.

Involvement in activities to promote dental provider registration in, or use of, the state’s PDMP was the lowest priority; states indicated they were already involved in these same activities. The most frequently

noted barriers for more involvement were inadequate staffing and funding, and the lack of a clear role for the SOHP.

Approaches (regardless of SOHP's involvement)

- including guidelines in dental and dental hygiene school curricula.
- education for dental professionals about alternatives to opioids and the existence of and regulations for PDMPs.
- availability of continuing education courses, especially when required for license renewal or a reduction in license fees.

One state noted that disseminating the information to a “wide enough segment” of the dental provider population seemed to have an impact and suggested that the challenge is “finding ways to reach those rural and older dentists who may not utilize electronic information as readily.”

Perceived barriers to dental practices using PDMPs

- dental software systems not effectively forcing the user to log into the PDMP system.
- staff not taking the time to use the system to check patient histories before appointments.
- electronic health records not always interacting between medical and dental records even in the same health system.
- rural providers often being less well equipped, and some offices not using electronic records.

These activities and priorities suggest that SOHPs can engage effectively in partnerships with state regulatory programs and other agencies, and with professional organizations in promoting guidelines for opioids prescribing and active participation in state PDMPs; for example, SOHPs may work with state pharmacy programs to bring information to dental providers to facilitate compliance. They can also assist in crafting messaging for patient counseling and education about use of these medications and with appropriate state and local entities about safe disposal. By participating in interdisciplinary initiatives, SOHPs can contribute to interprofessional education, collaboration, and training around changing opioid prescription practices for dental issues.

Policy Statement

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References

- ¹ Florence CS, Zhou C, Luo F, Xu L. The economic burden of prescription opioid overdose, abuse, and dependence in the United States, 2013. *Med Care*. 2016;54(10):901-906. doi:10.1097/MLR.0000000000000625.
- ² Reinhart M, Scarpati LM, Kirson NY, et al. The economic burden of abuse of prescription opioids: a systematic literature review from 2012 to 2017. *Appl Health Econ Health Policy*. 2018;16(5):609-632. Accessed May 21, 2020. doi: 10.1007/s40258-018-0402-x.
- ³ Brady KT, McCauley JL, Back SE. Prescription opioid misuse, abuse, and treatment in the United States: An update. *Am J Psychiatry*. 2016;173(1):18-26. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4782928/>. Accessed Feb 10, 2020. doi: 10.1176/appi.ajp.2015.15020262.
- ⁴ Reynolds WR, Schwarz ES. Dentists' current and optimal opioid prescribing practices: A proactive review. *Mo Med*. 2019;116(5):347-350. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6797033/>. Accessed Feb 10, 2020.
- ⁵ Suda KJ, Zhou J, Rowan SA, et al. Overprescribing of opioids to adults by dentists in the U.S., 2011-2015. *AJPM* 2020;58(4):473-486. <https://www.ncbi.nlm.nih.gov/pubmed/32033856>. doi: 10.1016/j.amepre.2019.11.006.
- ⁶ Suda KJ, Durkin MJ, Calip GS, et al. Comparison of opioid prescribing by dentists in the United States and England. *JAMA Netw Open*. 2019;2(5):e194303-e194303. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2734067>. Accessed Jan 13, 2020. doi: 10.1001/jamanetworkopen.2019.4303.
- ⁷ Rummans TA, Burton MC, Dawson NL. How good intentions contributed to bad outcomes: the opioid crisis. *Mayo Clin Proc*. 2018;93(3):344-350. Accessed Aug 23, 2020. doi: 10.1016/j.mayocp.2017.12.020.
- ⁸ Gupta N, Vujicic M, Blatz A. Multiple opioid prescriptions among privately insured dental patients in the United States: evidence from claims data. *JADA* (1939). 2018;149(7):619-627.e1. www.ncbi.nlm.nih.gov/pubmed/29656805. doi: 10.1016/j.adaj.2018.02.025.
- ⁹ Schroeder AR, Dehghan M, Newman TB, et al. Association of opioid prescriptions from dental clinicians for US adolescents and young adults with subsequent opioid use and abuse. *JAMA Intern Med*. 2019;179(2):145-152. <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2717503>. Accessed May 21, 2020. doi: 10.1001/jamainternmed.2018.5419.
- ¹⁰ Meisel ZF, Lupulescu-Mann N, Charlesworth CJ, et al. Conversion to persistent or high-risk opioid use after a new prescription from the emergency department: evidence from Washington Medicaid beneficiaries. *Ann Emerg Med*. 2019;74(5):611-621. Accessed Aug 24, 2020. doi: 10.1016/j.annemergmed.2019.04.007.
- ¹¹ Miech R, Johnston L, O'Malley PM, et al. Prescription opioids in adolescence and future opioid misuse. *Pediatrics*. 2015;136(5):1169. Accessed May 21, 2020. doi: 10.1542/peds.2015-1364.
- ¹² Substance Abuse and Mental Health Services Administration. Rise in prescription drug misuse and abuse impacting teens. <https://www.samhsa.gov/homelessness-programs-resources/hpr-resources/rise-prescription-drug-misuse-abuse-impacting-teens>

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- ¹³ Johnson SB, Blum RW, GieddJN. Adolescent maturity and the brain: the promise and pitfalls of neuroscience research in adolescent health policy. *J Adolesc Health*. 2009 September; 45(3): 216–221.
- ¹⁴ Arain M, Haque M, Johal L, et al. Maturation of the adolescent brain. *Neuropsychiatric Disease and Treatment* 2013;9 449–461.
- ¹⁵ Maughan BC, Hersh EV, Shofer FS, et al. Unused opioid analgesics and drug disposal following outpatient dental surgery: A randomized controlled trial. *Drug Alcohol Depend*. 2016;168:328-334. Accessed May 21, 2020. doi: 10.1016/j.drugalcdep.2016.08.016.
- ¹⁶ Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Dental Pain. <https://www.cdc.gov/acute-pain/dental-pain/index.html>
- ¹⁷ Nalliah RP, Sloss KR, Kenney BC, et al. Association of opioid use with pain and satisfaction after dental extraction. *JAMA Netw Open*. 2020;3(3):e200901. doi:10.1001/jamanetworkopen.2020.0901.
- ¹⁸ Moore PA, Ziegler KM, Lipman RD, et al. Benefits and harms associated with analgesic medications used in the management of acute dental pain: An overview of systematic reviews. *JADA* (1939). 2018;149(4):256-265.e3. <https://www.ncbi.nlm.nih.gov/pubmed/29599019>. doi: 10.1016/j.adaj.2018.02.012.
- ¹⁹ Centers for Disease Control and Prevention. U.S. opioid prescribing rate maps | drug overdose | CDC injury center. <https://www.cdc.gov/drugoverdose/maps/rxrate-maps.html>. Updated 2020. Accessed May 21, 2020.
- ²⁰ Jones MR, Viswanath O, Peck J, et al. A brief history of the opioid epidemic and strategies for pain medicine. *Pain Ther*. 2018;7(1):13-21. Accessed Jul 6, 2020. doi: 10.1007/s40122-018-0097-6.
- ²¹ Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. About CDC's Opioid Prescribing Guideline. <https://www.cdc.gov/drugoverdose/prescribing/guideline.html>
- ²² American Dental Association. Current Policies. <https://www.ada.org/en/advocacy/current-policies>
- ²³ Dr. Robert Bree Collaborative was established in 2011 by the Washington State Legislature “...to provide a mechanism through which public and private health care stakeholders can work together to improve quality, health outcomes, and cost effectiveness of care in Washington State.” It is funded by the Washington State Health Care Authority. <https://www.qualityhealth.org/bree/about/background/>
- ²⁴ Dr. Robert Bree Collaborative/Washington State Agency Medical Directors’ Group, Seattle, WA. 2017. <http://www.breecollaborative.org/wp-content/uploads/Dental-Opioid-Recommendations-Final-2017.pdf>
- ²⁵ *Ann Emerg Med*. 2020;76:e13-e39. <https://doi.org/10.1016/j.annemergmed.2020.06.049>
- ²⁶ Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Prescription Drug Monitoring Programs (PDMPs) – What States Need to Know. <https://www.cdc.gov/drugoverdose/pdmp/states.html>.
- ²⁷ Bao Y, Pan Y, Taylor A, et al. Prescription drug monitoring programs are associated with sustained reductions in opioid prescribing by physicians. *Health Aff (Millwood)*. 2016;35(6):1045-1051. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5336205/>. Accessed Aug 24, 2020. doi: 10.1377/hlthaff.2015.1673.
- ²⁸ Haffajee RL, Mello MM, Zhang F, et al. States with overall robust prescription drug monitoring programs experienced reductions in opioids prescribed to commercially-insured individuals. *Health Aff (Millwood)*. 2018;37(6):964-974. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6298032/>. Accessed May 24, 2020. doi: 10.1377/hlthaff.2017.1321.
- ²⁹ Chua KP, Hu HM, Waljee J, et al. Opioid prescribing patterns by dental procedure among US publicly and privately insured patients, 2013 through 2018. *JADA* 2021;152(4):309-317. <https://doi.org/10.1016/j.adaj.2021.01.001>
- ³⁰ Okunev I, Frantsve-Hawley J, Tranby E. Trends in national opioid prescribing for dental procedures among Medicaid patients. CareQuest Institute for Oral Health, Boston, MA. Preprint version. <https://www.medrxiv.org/content/10.1101/2021.04.12.21255158v1.full.pdf>
- ³¹ Prescription Drug Monitoring Program Training and Technical Assistance Center. History of prescription drug monitoring programs. https://www.pdmpassist.org/pdf/PDMP_admin/TAG_History_PDMPs_final_20180314.pdf March 2018.
- ³² Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Prescription Drug Monitoring Programs (PDMPs) <https://www.cdc.gov/drugoverdose/pdmp/states.html>
- ³³ McCauley JL, Gilbert GH, Cochran DL, et al. Prescription drug monitoring program use: National dental PBRN results. *JDR Clin Trans Res*. 2019;4(2):178-186. Accessed May 21, 2020. doi: 10.1177/2380084418808517.
- ³⁴ Rasubala L, Pernapati L, Velasquez X, et al. Impact of a mandatory prescription drug monitoring program on prescription of opioid analgesics by dentists. *PLoS ONE*. 2015;10(8):e0135957. Accessed May 21, 2020. doi: 10.1371/journal.pone.0135957.
- ³⁵ Prescription Drug Monitoring Program Training and Technical Assistance Center. <https://www.pdmpassist.org/>

³⁶ Network for Public Health Law. [Laws Limiting the Prescribing or Dispensing of Opioids - Network for Public Health Law \(networkforphl.org\)](https://www.networkforphl.org)

³⁷ Michigan Department of Licensing and Regulatory Affairs (LARA) and the Michigan Department of Health and Human Services. Michigan opioid laws frequently asked questions (FAQS), updated on March 6, 2019. https://www.michigan.gov/documents/lara/LARA_DHHS_Opioid_Laws_FAQ_05-02-2018_622175_7.pdf

³⁸ McCauley JL, Leite RS, Melvin CS, et al. Dental opioid prescribing practices and risk mitigation strategy implementation: identification of potential targets for provider-level intervention. *Substance Abuse* 2016;37(1):9-14.

³⁹ Contreras OA, Stewart D, Valachovic RW. American Dental Education Association Office of Policy, Research and Diversity. Policy Brief: The Role of Dental Education in the Prevention of Opioid Prescription Drug Misuse. March 2018. <https://www.adea.org/policy/white-papers/preventing-opioid-prescription-drug-misuse.aspx>

⁴⁰ Escontrías OA, Istrate E, Stewart DCL. Curricular and clinical approaches to addressing the opioid epidemic: Results from the 2019 ADEA opioid dental school survey. *J Dent Educ*. 2020 Dec;84(12):1359-1367. doi: 10.1002/jdd.12452. Epub 2020 Oct 22. PMID: 33089898, <https://doi.org/10.1002/jdd.12452>

⁴¹ Katzman JG, Fore C, Bhatt S, et al. Evaluation of American Indian health service training in pain management and opioid substance use disorder. *AJPH* 2016;106(8):1427-1429. <https://www.ncbi.nlm.nih.gov/pubmed/27196642>. doi: 10.2105/AJPH.2016.303193.

⁴² Personal correspondence, Debono Hughes, DDS, Director, Office of Oral Health, Maryland Department of Health Prevention and Health Promotion Administration, July 2021.

⁴³ Personal correspondence, Association of State and Territorial Dental Directors. Provided May 14, 2020.