MedEdPORTAL® The AAMC Journal of Teaching and Learning Resources

Original Publication

Open Access

# Addressing the Opioid Crisis: A Dynamic Case-Based Module Set for Interprofessional Educators, Learners, and Clinicians

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## Abstract

**Introduction:** In 2017, the opioid crisis was declared a public health emergency in the United States. The CDC has called for a multifaceted, collaborative approach to address the opioid epidemic. Though many resources have been made available for provider education, much of what has been published to date has focused narrowly on specific contexts and/or has become outdated. **Methods:** To address the need for more up-to-date and broad-based training, we designed a dynamic, module-based curriculum aligned with the 2016 CDC Opioid Prescribing Guideline. The three-part module set addresses safe opioid prescribing, recognizing and treating opioid use disorders, and opioids and pain management. Each module contains interactive content and assessments and culminates in case-based applications. The modules provide an anchor point for supplemental activities that can be utilized in various contexts. **Results:** As of May 2021, we recorded 3,529 module completions (≥80% performance on module assessments). A 6-month follow-up survey revealed that the majority of respondents had used the strategies they had learned to improve their prescribing practice and believed they had improved outcomes for patients. **Discussion:** The modules and supplementary resources can be used by clinicians and educators to combat the opioid epidemic with best practices in patient care and by meeting many state licensure requirements. Included supplemental resources are ideal for learners, providing a comprehensive understanding of the opioid crisis as well as tools for medication-assisted treatment that create capacity to immediately address these issues once learners become fully licensed.

**Keywords**

Substance Abuse/Addiction, Pain Management, Case-Based Learning, Opioid Use Disorder, Opioids, Addiction, Pain, Interprofessional Education

## Educational Objectives

Upon completion of this activity, learners will be able to:

1. Utilize tools and guidelines—including risk assessment, patient education, goal setting, and CDC-recommended best practices—for safe opioid prescribing.
2. Compare strategies and medications used in pain management.
3. Discuss signs and symptoms of and treatments for opioid use disorder.
4. Describe strategies for discontinuing opioid therapy that is unsafe or not sufficiently beneficial.
5. Utilize freely available resources for safe opioid prescribing, diagnosing and treating opioid use disorder, and pain management.

**Citation:**

Porter R, Barnett J, Blazar M, Pinheiro S, Bowlby L. Addressing the opioid crisis: a dynamic case-based module set for interprofessional educators, learners, and clinicians. *MedEdPORTAL*. 2022;18:11238. https://doi.org/10.15766/mep_2374-8265.11238

## Introduction

Similar to infectious disease epidemics, the opioid epidemic has a natural history, which did not unfold overnight. The use of opioids like morphine to treat wounded soldiers can be traced back to the 1860s. The Bayer Company subsequently introduced heroin in 1898, touting it to be less addictive than morphine.[1] With passage of the Harrison Narcotics Tax Act of 1914, the U.S. outlawed heroin and required providers to prescribe narcotic and opioid medication as a mechanism to combat narcotic addiction, and regulate these highly addictive substances.[1]

Over the next 7-8 decades, various regulations were enacted to decrease and regulate the use of opioids. Subsequently, by the early 1980s, concerns related to the undertreatment of patients' pain became a recognized health concern, and the United States passed regulations that allowed for aggressive treatment for pain.

In 1995, Purdue Pharma introduced OxyContin and marketed it as a less addictive opioid alternative.[1] Providers overprescribed this medication and other opioids in response to this marketing for treating "pain as the 5th vital sign," and thus, more individuals developed dependency and addiction.[2]

Around the turn of the 21st century, there was an uptick in opioid-related concerns, as well as an almost fourfold increase in opioid overdose deaths between 1999 and 2008.[3] Health care providers wrote approximately 259 million opioid prescriptions in 2012, which equated to a prescription and bottle of pills for every person living in the U.S.[4] With increasing incidence of emergency department (ED) visits involving opioids, health care providers and clinically training health professional students became just as likely to see an opioid-related overdose during an ED shift as they were other emergent medical concerns.

In 2017, there were 128 deaths per day due to opioids, and opioid overdose was declared a national emergency in the United States. Today, around three million U.S. citizens have had, or currently suffer from, opioid use disorder. More than 500,000 in the United States are dependent on heroin, and approximately 80% of new heroin users in the United States report prescription opioid pills as their initiation to opioid use and subsequent opioid use disorder.[5] Unfortunately, in the 12 months that ended in May 2020, there were 81,000 overdose deaths in the United States—the highest number of overdose deaths ever recorded within a 12-month time frame—reminding us that there is work still to be done.[6]

The Centers for Disease Control and Prevention (CDC) have proposed that a multifaceted collaborative public health and law enforcement approach is required to address the opioid epidemic. Response efforts should include implementation of the CDC Guideline for Prescribing Opioids for Chronic Pain, staff/provider education, and medication-assisted treatment (MAT) as key strategies to achieve reduction of opioid use disorder and overdose deaths.[4]

In support of efforts to address the opioid epidemic, we were awarded Health Resources and Services Administration (HRSA) funding to develop and implement a curriculum aimed at increasing awareness and education on opioid use disorders among health professional students, providers, and community preceptors. In line with CDC recommendations, this innovative curriculum is multifaceted and provides education in the areas of opioid and pain management, safe opioid prescribing, recognizing and treating opioid use disorders, and MAT-waiver training. The curriculum was incorporated into our physician assistant (PA) program and also offered via the web, where providers could earn category I continuing medical education (CME) credits, fulfilling various state licensing renewal requirements. The curriculum was made accessible to anyone free of charge during the grant period and served to address the ongoing opioid epidemic, which has become a public health crisis and national emergency.

Currently available resources in *MedEdPORTAL,* with publications ranging from 2011 to 2020, address many important areas of opioid management, including minimizing use of prescription opioids in patients with chronic, nonmalignant pain, as well as mitigation strategies and overuse resuscitation.[7,8] These offerings, while highly valuable and important, no longer address current trends; the opioid crisis continues to evolve, and with it, research, treatment guidelines, and management strategies have changed. Additionally, other opioid offerings in *MedEdPORTAL* are targeted at narrow audiences, specifically, the management of opioid overdose in the inpatient setting and ED.[9,10] Our activity provides a more current review of important topics in opioid management, including safe opioid prescribing, recognizing and treating opioid use disorder, and pain management. The modules and curriculum presented here also differ from more traditional modes of opioid-focused didactic instruction by offering a more actively engaging design for learning. The overall model is scalable and highly adaptable to a variety of target audiences, including practicing clinicians seeking to meet state medical board requirements and diverse groups of health professions learners at various stages in training.

## Methods

As part of the HRSA grant project, an interprofessional team composed of clinician educators, opioid and pain experts, and education specialists convened in 2017 to design a curriculum that would help address the opioid crisis. Using the 2016 CDC guideline[4] as an anchor point, the team developed a dynamic modular curriculum to address opioid use disorders and promote effective implementation of the new prescribing guidelines among current providers and the medical learners who would soon become providers. We developed an instructional design framework from existing literature and evidence in the areas of adult learning and online professional development for health care professionals.[11-15] In organizing the scope and sequence of the curriculum, the team employed backwards design,[16] centered upon the content of the CDC guideline, which lent itself to a structure of three separate but interrelated 1-hour online modules: Safe Opioid Prescribing (Appendix A), Recognizing and

Treating Opioid Use Disorder (Appendix B), and Opioids and Pain Management (Appendix C).

The team designed the learning objectives and module content to cumulatively meet state-level controlled substance CME requirements for prescribers, but the modules' nondependent sequence also allowed for stand-alone completion of individual modules as appropriate for different learners and contexts. The content and assessments were also scaffolded according to the revised Bloom's taxonomy[17] to meet the varied needs of medical learners, clinical preceptors, and noneducator clinicians.

The three 1-hour modules followed a common structure anchored by formative assessments, detailed feedback, and authentic case applications. We divided each module into chaptered sections concluding with formative assessment items, with the final section culminating in higher-level case-based application. In order to maximize user engagement, each module incorporated interactivity through the use of varied question structures (matching, drag and drop, pick many, pick one, text entry) manipulation of on-screen objects, and links to optional free web resources for further exploration and application (all websites included in the modules were optional). Visual and text elements were structured as infographics with interactive layers to be manipulated by users as they engaged with the content. For example, we presented the 12 recommendations central to the CDC guideline as clickable puzzle pieces that each revealed details of a specific recommendation.

The team developed novel assessment items in alignment with each module's objectives, spanning the levels of the revised Bloom's taxonomy[17] and employing a variety of question formats. Formats ranged from multiple choice (Appendix D) and short answer to constructed essay response. The number of user attempts allowed varied based on the difficulty of each item, and tailored feedback was included at both the item and distractor levels. For open-ended items, sample correct responses and resources were provided for immediate comparison and further learning.

The software used to construct the modules, Articulate Storyline,[18] allowed them to be posted online or locally for interactive use and enabled completion tracking within various learning management systems. Compressed folders of the launch files were included with instructions in Appendices A-C. Each module began with a navigation guide and structural outline. A PDF version of the content slides (included in Appendices A-C) has also been made available within each module and can be downloaded by learners for future reference. Module objectives and a detailed outline of the module content were included in Appendices E and F.

We initially made the modules available to first-year PA students via the institution's learning management system and integrated the modules into the PA program's didactic curriculum as follows:

- Opioids and Pain Management: Pharmacology I, fall semester.
- Safe Opioid Prescribing: Patient Assessment and Counseling III, spring semester.
- Recognizing and Treating Opioid Use Disorder: Clinical Medicine III, spring semester.

The modules constituted the core of a new curriculum, anchoring related supplemental curricular components including additional case discussions and book clubs. Many of these were incorporated into the clinical year, during which we also encouraged PA students to complete the full MAT-waiver training so they would be eligible for certification immediately following graduation and professional certification. Full MAT-waiver training was embedded in a one-credit Opioids in America elective that included an in-depth look into the patient/family experience of living with opioid use disorder, completion of the full 24 hours of MAT-waiver training required for PAs, and a Q&A session with a content expert. A sample curriculum outline with flexible sequencing of core and supplemental activities was included in Appendix G.

During the same period, the modules were also included in the interprofessional preceptor mini-fellowship component of the HRSA grant. Preceptors participating in the grant's mini-fellowship completed the online modules in tandem with three face-to-face full-day sessions that included role-play with standardized patients, engaging in difficult conversations in real time, based on cases similar to the supplemental cases included in Appendix H. The mini-fellowship also integrated the opioid focus with quality improvement projects the preceptors would go on to implement with students in the clinical setting. Participants were encouraged to complete grant-funded MAT training and utilize our physician consultants, including opioid treatment experts, for support as they cared for patients with an opioid use disorder.

Hosting of the modules on the institution-wide learning management system made them available to students and providers (PAs, MDs, doctors of osteopathic medicine [DOs], and nurse practitioners [NPs]) throughout the university health center and network. Grant funding also enabled partnership with AHEConnect[19] to make the modules available free of charge to

the general public from their web portal during the grant period. The modules were advertised to clinicians and health professions students through direct communications, email lists, and national conference presentations. The flexible on-demand nature of the modules as hosted on the two sites made them easily accessible, resulting in high levels of utilization. As of May 2021, over 3,500 individual module completions had been recorded across the two platforms.

To evaluate the effectiveness of the curriculum, we incorporated knowledge assessments within each of the modules and administered two participant feedback surveys. The knowledge assessment was composed of questions embedded within each module, as described above. Successful completion required users to score at least 80% to be eligible for CME. The team developed a feedback survey (Appendix I) to measure the satisfaction and acceptability of the curriculum, basing the survey items on institutional joint accreditation requirements. The survey was administered immediately after the completion of the modules, linked from the last slide within each one, and required for CME credit. In order to measure the impact of the curriculum, a follow-up survey (Appendix J) was also administered via email 6 months after completion of the modules. This survey was sent only to providers, not to current students, since its purpose was to ascertain the utilization of the concepts learned through the modules in the clinical practice setting.

## Results

Since the launch of the curriculum in 2018, the project has garnered increasing interest and participation. As of May 2021, we have recorded 3,529 module completions (≥80% performance on module assessments) across the AHEConnect[19] and institutional learning management system sites (Table 1). In addition to scoring at least 80% on module assessments, participants completing the end-of-module evaluation survey (Appendix I) also self-reported increased knowledge and skills, as well as having met the module learning objectives, as shown in Table 2.

A follow-up survey (Appendix J) was emailed in August 2020 to 922 practicing clinicians who had completed at least one of the modules no less than 6 months prior (students were excluded). The Figure shows that of the 95 responses collected (response rate: 10%), 87% reported increased knowledge about the relevant issues, while more than three out of four clinicians reported using the strategies they had learned to improve their prescribing practice. Almost two-thirds of respondents believed that they had improved outcomes for patients receiving opioid therapies. Majorities of respondents reported (a) changing protocols, policies, or procedures related to opioid prescribing in their practice setting and (b) recommending the modules to others; almost half of respondents engaged other team members in improving opioid prescribing. Of these 95 respondents, 43% identified themselves as MDs or DOs, 44% as PAs, 8% as NPs, and 4% as other health professions.

**Table 1.** Recorded Module Completions

| Module Title | No. Individual Completions[a] |
|---|---|
| Safe Opioid Prescribing | 1,416 |
| Recognizing and Treating Opioid Use Disorder | 1,062 |
| Opioids and Pain Management | 1,051 |

[a]Eighty percent or greater performance on module assessments as of May 1, 2021.

## Discussion

As the opioid epidemic continues to be at the forefront of public health challenges in the United States, providers and health professions educators are in need of evidence-based training that adequately prepares the health care community to address these important and complex conditions. In accordance with the CDC's recommendation for a multifaceted approach to managing the opioid epidemic, health care providers must become familiar with and comfortable implementing the CDC Guideline for Prescribing Opioids for Chronic Pain.[4] Additionally, practices and institutions need to provide adequate education to staff and providers, meet state regulatory requirements, and work to implement MAT services at their facilities.

Prior published work on opioid curricula have focused on a very narrow scope of learners and settings. Through an HRSA-funded grant, the three-part interactive opioid module series was created to better equip current and future clinicians with the requisite knowledge and skills to care for individuals with an opioid use disorder. The modules were designed to be engaging and accessible for use in any setting, with any professional background, and by any stage of learner. Though this heterogeneous group of learners presented a challenge when structuring dense content in ways that would be meaningful across contexts, the participant assessment outcomes and survey data suggest that the module series has the requisite flexibility to meet the need. Initial data from over 3,500 individuals demonstrate the utility and efficacy of these modules across a variety of disciplines for both learners and professionals. The modules provided online accessibility to quality content at no cost, which promoted flexibility and appeal to a wider and heterogeneous group of learners and providers. Learners did not have to travel and could complete the modules in a time frame that was convenient, meeting their individual learning needs.

**Table 2.** Opioid Module Participant Feedback[a]

| Evaluation Survey Item | Yes/Agree |
|---|---|
| This activity increased my knowledge/competence. | 86% |
| This activity increased my skills/strategy. | 81% |
| This activity improved my performance. | 74% |
| This activity will improve my patient outcomes. | 74% |
| Overall, did the module reflect deep content knowledge on the part of the authors/designers? | 99% |
| As a result of completing this module, I am better able to: [each module objective listed]. | 94%[b] |

[a]*N* = 1,948; 61% response rate as of May 1, 2021.
[b]Average for all module objectives.

Given the breadth of the opioid epidemic, these modules address a dire need for high-quality, on-demand provider education and training on opioid use disorders. The interprofessional module-development process and the overall project structure can be implemented by various professions and across institutions to address the needs of clinicians and the community and to meet local/state regulations for opioid prescribing. As the grant project that funded the initial development and implementation of the modules comes to a close, publishing the curricular offerings in *MedEdPORTAL* ensures their ongoing accessibility. By downloading the module files, resources, and documentation included in the appendices, institutions should be able to utilize the curricula on their individual platforms and award CME, thus expanding the reach of these important educational tools.

As the tools are technology based, they have intrinsic limitations based on the systems, support, and skills of end users. However, we hope that the included resources, as a guide, can be utilized independent of web hosting or internet access. As with any educational offering, this curriculum requires time and bandwidth for engagement, both of which can be in short supply for professionals and students. Within our PA program, we found it valuable to embed the modules within other related content and to augment them with supplemental materials. While this approach may not be feasible for practicing professionals, clinics and health care provider organizations should consider ways in which they might be able to embed the modules and/or the supplemental materials within existing professional development, quality improvement efforts, or team learning processes, for example, as a part of annual required trainings like workplace safety, HIPAA compliance, and so on. Additionally, as the opioid crisis evolves and medical knowledge changes, access to content experts may be needed to assist with content updates. State chapters for the Society of Addiction Medicine can be a helpful resource in locating and engaging expertise to support such curriculum update efforts.[20]

This innovative curriculum will assist in efforts to better prepare current and future clinicians to participate in the care of those with an opioid use disorder and fill a much-needed gap in communities where there are more individuals with an opioid use disorder than there are clinicians trained to care for them. Through this process, we aim to create increased capacity to address the opioid crisis in the U.S. and to provide effective tools and strategies to begin to mitigate its long-standing negative impact on communities nationally. Recognizing that

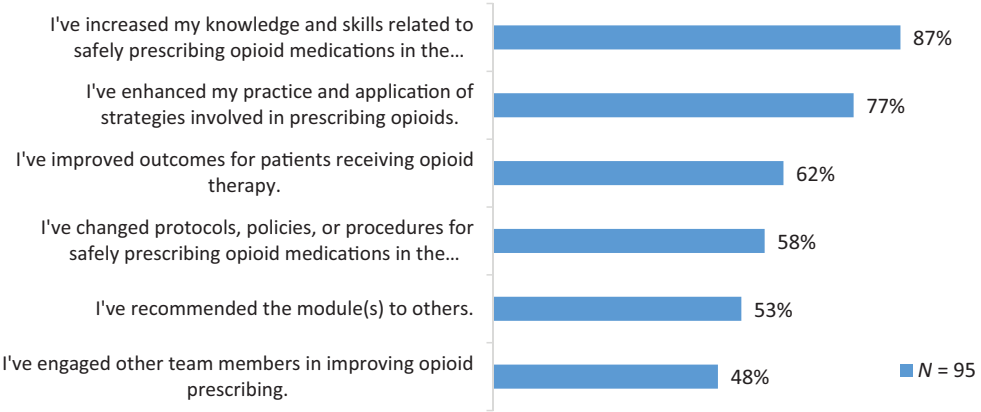


**Figure.** Six-month follow-up survey data: self-reported changes in practice.

a multifactorial approach is needed, we hope that our flexible and adaptable curriculum can be a part of a multipronged strategy that includes provider education alongside community engagement, advocacy, policy changes, and other national mitigation efforts.

## Appendices

A. Safe Opioid Prescribing Module folder

B. Recognizing and Treating OUD Module folder

C. Opioids and Pain Management Module folder

D. Module MCQ Assessment Items.docx

E. Opioid Module Objectives.docx

F. Detailed Module Content Outline.docx

G. Sample Curriculum Outline.doc

H. Supplemental Opioid Cases.docx

I. Opioid Module Evaluation Survey.docx

J. Opioid Module 6-Month Follow-up Survey.docx

*All appendices are peer reviewed as integral parts of the Original Publication.*

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### Disclosures

None to report.

### Funding/Support

The development of this project was supported by the Health Resources and Services Administration of the U.S. Department of Health and Human Services as part of an award totaling $2.3 million with 0 percentage financed with nongovernmental sources.

### Prior Presentations

Barnett J, Porter R. Leveraging e-learning to respond to the opioid crisis. Oral mini-presentation given at: IAMSE Annual Meeting; June 9, 2019; Roanoke, VA.

Barnett J, Porter R, Pinheiro S. Leveraging e-learning to respond to the opioid crisis. Poster presented at: PAEA Learning Forum; October 12, 2019; Washington, DC.

Barnett J, Porter R, Pinheiro S. Leveraging technology to respond to the opioid crisis. Poster presented at: NCAPA Winter Conference; February 15, 2020; Raleigh, NC.

Barnett J, Pinheiro S, Blazar M, Porter R. Creating an opioid curriculum continuum for students, preceptors, and providers. Spotlight session presented virtually at: PAEA Learning Forum; October 20, 2020.

### Ethical Approval

Reported as not applicable.

### Disclaimer

The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by the Health Resources and Services Administration, the U.S. Department of Health and Human Services, or the U.S. Government.

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**Received:** August 5, 2021
**Accepted:** January 13, 2022
**Published:** March 24, 2022