

UCSF

UC San Francisco Previously Published Works

Title

California Poison Control System Implementation of a Novel Hotline to Treat Patients with Opioid Use Disorder

Permalink

<https://escholarship.org/uc/item/6h06010n>

Journal

Journal of Medical Toxicology, 17(2)

ISSN

1556-9039

Authors

LeSaint, Kathy T
Ho, Raymond Y
Heard, Stuart E
[et al.](#)

Publication Date

2021-04-01

DOI

10.1007/s13181-020-00816-1

Peer reviewed



California Poison Control System Implementation of a Novel Hotline to Treat Patients with Opioid Use Disorder

Kathy T. LeSaint^{1,2} · Raymond Y. Ho^{2,3} · Stuart E. Heard^{3,4} · Craig G. Smollin^{1,2}

Received: 2 July 2020 / Revised: 28 September 2020 / Accepted: 29 September 2020 / Published online: 19 October 2020
© American College of Medical Toxicology 2020

Abstract

Introduction In response to the opioid epidemic, California state officials sought to fund a variety of projects aimed at reducing opioid-related deaths. We describe the California Poison Control System's (CPCS) successful effort in integrating itself into the state's public health response to the opioid epidemic and describe poison control center staff attitudes and perceptions regarding the role of poison control centers at treating opioid withdrawal and addiction.

Methods The CPCS created a leadership team and a separate 24/7 hotline, called the CPCS-Bridge line, to field calls from frontline health care providers interested in initiating medications for opioid use disorder for their patients. The implementation process also included training of all CPCS staff. In addition, the leadership team conducted an anonymous survey study to analyze attitudes and perceptions of poison center staff on the role of the poison center in the management of opioid use disorder. Descriptive statistics were used to characterize the data.

Results Calls to the new hotline increased over time, along with CPCS-initiated outreach and advertisement. A majority of questions received by the hotline were related to uncomplicated buprenorphine starts in special populations. A pre-training survey was completed by 27 (58%) of CPCS specialists, many of whom had no prior experience treating patients with opioid use disorder. Only one specialist (2%) did not believe that poison centers should play a role in opioid addiction.

Conclusions The California Poison Control System successfully created a hotline to assist frontline health care providers in treating patients with opioid use disorder and highlight the critical role of poison centers in the public health domain. Increased federal funding to poison centers is likely to be mutually beneficial to all parties involved.

Keywords Poison control centers · Medication-assisted treatment · Opioid use disorder

Supervising Editor: Mark B. Mycyk, MD

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s13181-020-00816-1>) contains supplementary material, which is available to authorized users.

✉ Kathy T. LeSaint
kathy.lesaint@ucsf.edu

¹ Department of Emergency Medicine, University of California, 1001 Potrero Avenue, Building 5, Room 6A, San Francisco, CA 94110, USA

² San Francisco Division, California Poison Control System, San Francisco, CA, USA

³ Department of Clinical Pharmacy, University of California, San Francisco, San Francisco, CA, USA

⁴ Central Office, California Poison Control System San Francisco, CA San Francisco, USA

Background

In 2017, the Substance Abuse and Mental Health Services Administration awarded the California Department of Health Care Services (DHCS) an Opioid State Targeted Response grant. DHCS created the California Medication Assisted Treatment (MAT) Expansion Project with aims to increase access to medications for the treatment of opioid use disorder, to reduce unmet treatment need, and to reduce overdose-related deaths in response to the opioid epidemic [1]. The CA MAT Expansion Project sought to fund a variety of projects throughout the state. In early 2018, the California Poison Control System (CPCS) leadership and DHCS partnered to develop addiction treatment expertise and leverage poison center resources to support the use of medications for the treatment of opioid use disorder for counties participating in the CA MAT Expansion Project.

The CPCS, with its four divisions (Fresno, Sacramento, San Diego, and San Francisco), provides 24/7 telephone consultation to 40 million California residents. The group of CPCS specialists in poisoning information, composed of a registered nurse and trained pharmacists, answer the phone lines. The system consults on approximately 250,000 human exposure cases per year. In 2018, the CPCS consulted on 7018 cases related to opioids. Of these, 5821 involved human exposures and 1195 were information cases (i.e., cases in which callers sought information regarding opioids). A majority of exposures (70%) originated from health care facilities.

The CPCS leadership recognized that each interaction with a health care facility represented a unique opportunity to introduce strategies for long-term management of opioid use disorder, including the initiation of medications such as buprenorphine. At the same time, California was developing a plan to increase the utilization of medications for opioid use disorder, particularly in emergency department settings [2]. Therefore, CPCS leadership created a grant proposal to develop expertise for their staff in the areas of opioid overdose, opioid withdrawal, and the initiation of buprenorphine, while leveraging the existing scope, ease of access, and current CPCS/emergency department consultation relationships. Specifically, CPCS leadership proposed the development of a separate 24/7 hotline, called the CPCS-Bridge line, which could be accessed by frontline health care providers interested in initiating medications for opioid use disorder for their patients.

The creation of a dedicated CPCS-based hotline to assist in the treatment of opioid use disorders was unprecedented, and no formal studies existed regarding poison center specialists' beliefs regarding this type of program. During the hotline implementation process, we assessed a sample of specialists' attitudes toward the treatment of patients with opioid use disorder and to identify their concerns. Such attitudes were thought to affect provider participation or program efficacy.

Methods

The project leadership team included the poison control center medical director, managing director, medical toxicology and emergency medicine attending, and a certified specialist in poisoning information. The team divided the project into three phases: phase I (planning), phase II (training), and phase III (implementation). Phase I and II occurred from July 1 to October 31, 2018. The implementation phase of the project began on November 7, 2018.

Phase I (planning) started with creating a new, dedicated CPCS-Bridge phone number (hotline) for health care providers seeking assistance with treatment of opioid withdrawal, and a call-forwarding algorithm for the regular poison center hotline. In addition, phase I included brainstorming and

strategy sessions to develop a comprehensive curriculum for poison control center specialists. The project leadership team tried to anticipate the types of questions potentially asked of CPCS staff and included those content areas in the training materials. The team identified six main content areas (Table 1).

In addition, the team developed several case-based scenarios simulating potential calls to the CPCS hotline, adapted existing resource materials to develop quick reference guides that included a “FAQ,” and links to online resources for poison center staff. The leadership team sought feedback from other stakeholders, including addiction medicine specialists and medical toxicologists at the University of California, San Francisco, and other statewide programs, who reviewed the training materials for accuracy and consistency with other ongoing California statewide initiatives.

In phase II (training), teaching materials were used to prepare staff members at all four divisions of the CPCS. Staff chose between taking a mandatory training session in person or by videoconferencing. Each training session was divided into “Project Overview” and “Simulated Case” lectures using case-based scenarios. All 41 poison center specialists participated in at least one of seven separate training sessions. Each session was approximately 1 hour in duration and allowed for a question and answer period. The sessions were recorded and made available to CPCS staff to reference at any time, and all project resources were centralized and made available on an internal intranet website.

Prior to each training session, the poison center specialists were administered an anonymous survey created by the CPCS leadership team. The survey aimed to evaluate the following areas from our staff: demographics, baseline confidence in managing acute opioid overdose and opioid withdrawal, opinions regarding whether poison control centers should be involved in opioid withdrawal management, and whether poison control centers can play an important role in the treatment of opioid addiction. The surveys were first piloted among the medical and managing directors at the three other poison control centers within CPCS—Fresno, San Diego, and Sacramento. Surveys were not mandatory and were administered using Qualtrics as a URL link or QR code at the beginning of the training session. Response types included Likert scales, yes/no, and open-ended responses. Categorical variables were tabulated. Data were compiled and analyzed in Microsoft Excel using descriptive statistics.

Phase III (implementation) of the project began in November 2018. The team began widely advertising the service through the grant funder, answered hotline calls, and provided feedback and continued staff training. Clinicians were encouraged to call the hotline if and when they had questions regarding the initiation of medications for opioid use disorder. It was at the discretion of each poison control center specialist to obtain an on-call physician for medical

Table 1 Major content areas of training material.

Content area	Description
Project background	Review of the opioid epidemic and description of the poison center's potential role in addressing the problem.
Buprenorphine pharmacology	Review of buprenorphine pharmacology, pharmacokinetics, bioavailability, potential drug-drug interactions, indications, contraindications, and common side effects.
Legal considerations	Review of the legal requirements for administering and prescribing buprenorphine, with emphasis on the emergency department setting.
Recognition of opioid withdrawal	Review of objective measures available to identify patients with acute opioid withdrawal (i.e., Clinical Opiate Withdrawal Scale), and the clinical application in administering buprenorphine at the appropriate dose and time.
Existing buprenorphine protocols	Existing protocols and their application in the clinical setting. ¹
Internal processes for managing calls	A description of how CPCS would handle the routing of calls to staff, the documentation procedures in the poison center record, follow-up requirements, and mechanisms for ongoing feedback to CPCS staff.

¹ California Bridge Program. Resources to treat substance use disorders from the acute care setting. Available at: <https://www.bridgetotreatment.org/resources>. Accessed 15 May 2020

back-up (i.e., if the specialist felt comfortable managing the case, then the on-call physician was not contacted).

To further promote hotline utilization, the CPCS also began performing outreach on all calls related to opioids directed to the regular poison center hotline. An example of an outreach call is one of a clinician calling for assistance in treating a patient experiencing an acute opioid overdose. Upon assisting the clinician regarding acute overdose treatment, the specialist would inform the caller that the CPCS-Bridge hotline is available to provide technical assistance should the patient be amenable to engage in medications for opioid use disorder.

During the implementation phase, the leadership team collected data for the purpose of reporting and quality control. Calls were analyzed together by the poison control center medical director and managing director, who classified calls based on the type of question(s) asked.

Results

Attitudes and Perceptions of Poison Center Staff Identified Through a Pre-training Survey

A total of 27 (58%) CPCS specialists completed the pre-training survey. The results are summarized in Table 2. The median number of years of experience of CPCS specialists was 20 years (IQR 9–26). Only 4 specialists (15%) had previous experience caring for patients with opioid use disorder. This experience included exposure to patients with opioid use disorder/substance use disorder on inpatient rotations during pharmacy school ($N = 3$, 11%), and one person (4%)

described managing opioid use disorder as hotline staff over their many years as a poison center specialist. Eleven (41%) specialists managed a call on the hotline involving the use of buprenorphine, while 13 (48%) had advised on the use of methadone for the treatment of opioid withdrawal. However, only 2 (7%) respondents had used a standardized tool to assess opioid withdrawal, with one having used the Clinical Opiate Withdrawal Scale and one respondent having used a clonidine titration protocol while working at an outpatient free clinic.

The average scores on a 5-point Likert scale assessing CPCS specialists' confidence in managing acute opioid overdose, opioid withdrawal, and their opinion regarding poison center involvement in the management of opioid withdrawal are displayed in Table 2. Overall, specialists were more confident in managing opioid overdose than opioid withdrawal and had the most confidence in managing cases involving heroin and least confidence in managing overdose or withdrawal involving buprenorphine (versus prescription opioids or methadone). Finally, 8 (30%) specialists indicated that poison control centers can play an important role in opioid addiction. On average, specialists were neutral (score 3.19) regarding whether poison control centers should be involved in the management of opioid withdrawal; 5 (19%) reported "definitely yes" while 1 (4%) reported "definitely no." Only one specialist who did not believe that poison centers should play a role in opioid addiction recorded a free-text response:

We could provide guidance to start the management of symptoms, or even start buprenorphine. However, these patients critically need follow up and psychosocial support for a chance of successful treatment.

Table 2 Pre-training survey responses (*N* = 27).

Years as a poison center specialist (median, IQR)	20 (IQR 9–26)
Previous experienced in caring for patients with opioid use disorder	4 (15%)
Managed a call on the hotline involving the use of buprenorphine to treat opioid withdrawal	11 (41%)
Managed a call on the hotline involving use of methadone to treat opioid withdrawal	13 (48%)
Used a standardized tool to assess opioid withdrawal	2 (7%)
Poison control centers can play an important role in opioid addiction	8 (30%)
	Average score
	Scale of 1–5
	(1 = not confident, 5 = very confident)
Confidence in managing acute opioid overdose	
Prescription opioids	4.22
Methadone	4.15
Buprenorphine	3.96
Heroin	4.22
Confidence in managing acute opioid withdrawal	
Prescription opioids	3.26
Methadone	3.19
Buprenorphine	2.96
Heroin	4.22
	Average score
	Scale of 1–5
	(1 = definitely no, 5 = definitely yes)
Poison control centers should be involved in the management of opioid withdrawal	3.19

Calls to the New Hotline

Initially, few calls were made to the hotline; however, over time, there was a gradual increase in the number of calls over the course of 1 year (Table 3). The CPCS started making outreach calls in September 2019 and rapidly expanded the number of total calls in 2019; calls from October through December in 2019 were nearly 2-fold that of the months prior.

Though CPCS-Bridge received 48 consultation calls during the project period, some of these calls involved multiple types of questions. A total of 53 types of questions managed by poison center staff are summarized in Table 4. The majority of questions (*N* = 18, 34%) were

related to complicated buprenorphine starts. They included special populations (elderly, pediatric, pregnancy) or patients with co-occurring additional substance use, concomitant sedative-hypnotic withdrawal, or an underlying significant medical condition. This was followed by uncomplicated buprenorphine starts (*N* = 10, 19%), general information about the use of buprenorphine (*N* = 8, 15%), and assistance in the identification of opioid withdrawal (*N* = 7, 13%). Many of the questions received on the hotline focused on areas that extended outside the areas of training based on our originally devised curriculum. For example, the hotline also fielded questions that were unrelated to opioids, including benzodiazepine and kratom withdrawal.

Table 3 CPCS-Bridge call volume over time.

Type	Nov–Dec 2018	Jan–Mar 2019	Apr–June 2019	July–Sept 2019	Oct–Dec 2019
Consultation (<i>N</i> = 48)	2	3	10	12	21
Outreach (<i>N</i> = 142)	--	--	--	14	128
Total cases	2	3	10	26	149

Table 4 Questions to the CPCS-Bridge hotline by type (*N* = 53).

Question type	<i>N</i> (%)
General information regarding buprenorphine	8 (15)
Calculation of dosing equivalents and drug-drug interactions	4 (8)
Hotline capabilities and hours of operation	2 (4)
Prescribing and legal considerations	2 (4)
Identification of opioid withdrawal (distinguishing from other withdrawal syndromes and use of Clinical Opiate Withdrawal Scale)	7 (13)
Uncomplicated buprenorphine starts	10 (19)
Complicated buprenorphine starts	18 (34)
Special populations (elderly, pediatric, pregnancy)	5 (9)
Co-occurring substance use, sedative-hypnotic withdrawal, or significant medical condition	13 (25)
Management of precipitated withdrawal from buprenorphine	3 (6)
Management of acute pain in patients on buprenorphine	2 (4)
Non-opioid-related questions	3 (6)
Benzodiazepine withdrawal	2 (4)
Kratom withdrawal	1 (2)
Linkage to care	2 (4)

Discussion

For decades, US poison control centers have been making a considerable impact in reducing emergency department visits and inpatient hospitalizations due to exposures to potentially harmful substances, leading to large overall cost savings for the health care system [3–8]. In addition, because all poison center data are collected in a national database, poison centers have been serving a critical public health role in identifying novel hazards and facilitating public health surveillance. Therefore, it is not surprising that poison control centers are uniquely positioned to respond to one of the nation's largest public health emergencies of the past decade.

The creation of a new hotline for the treatment of opioid use disorder and opioid withdrawal is relatively novel. Eight months prior to the implementation phase of CPCS-Bridge, the nation's first poison center-based opioid helpline was launched in Arizona with a partnership between the Arizona Department of Health Services and the Poison and Drug Information Centers of Arizona (Arizona and Banner). Poison center specialists staff this Opioid Assistance and Referral (OAR) Line and, in general, share similar goals and objectives as CPCS-Bridge [9]. Unlike CPCS-Bridge, which connects clinicians with poison center specialists with a pharmacy background, the OAR Line is staffed with physicians, nurses, pharmacists, and genetic counselors. In addition, the OAR can follow-up with patients directly to confirm their well-being and to address new or additional concerns [10].

CPCS-Bridge's pilot funding did not provide our organization with the resources to build a robust consultation group or detailed follow-up capacity. Despite this, we demonstrate the feasibility of developing a poison center-affiliated line with minimal impact on baseline staffing. Staff were not asked

to work extra shifts and handled CPCS-Bridge calls while also working on the general poison center hotline. However, continued funding beyond the pilot has allowed for further focus on capacity building and expansion of our current model through additional public health entity collaborations.

The success of this project depended on CPCS staff members' support and participation. Less than half of our staff had previous experience in caring for patients with opioid use disorder or treating opioid withdrawal using a standardized tool and medications such as buprenorphine and methadone. Although only one respondent who believed poison centers should not help treat opioid addiction gave a free-text response, we suspect those who did not support the new hotline shared the same apprehension. We agree with the sentiment posed in the free text that patients with opioid use disorder require a multimodal or whole-person approach to treating their addiction [11–13]. The creation of CPCS-Bridge, however, did not come with the expectation of treating opioid addiction as a whole, but rather as an opportunity for our poison control system to utilize an evidence-based and efficacious treatment modality. This is in line with the reality that buprenorphine for the treatment of opioid use disorder is now the standard of care across emergency departments in the US [14].

While our specialists were confident in the management of acute opioid overdose, confidence in managing opioid withdrawal was only slightly higher than average and therefore required dedicated teaching. Since the implementation of CPCS-Bridge, the leadership team has provided staff members with individualized feedback and quality improvement sessions. Anecdotally, the feedback from staff has been positive. Although we did not formally assess how prepared or confident specialists were in attending to calls after the training sessions,

we anticipated that many would not be immediately ready given the general discomfort of utilizing a new skillset. Nevertheless, our experience suggests that our staff is enthusiastic toward playing a role in curbing opioid addiction.

During the implementation period, CPCS-Bridge received a wide variety of calls and questions, some of which were unrelated to the initial goal of the project. Some of these calls, while unrelated to the purpose of the hotline, were still able to be answered by our poison control center specialists (e.g., patient with acute opioid overdose requiring naloxone). Other calls helped inform us of ways to improve our service and to identify unmet needs among frontline providers. For example, we saw that it was important to expand the existing training curriculum to include a focus on the treatment of special populations as well as the need for more robust linkage to outpatient care from emergency department settings. It also became clear that in order to best serve all callers, the success of the hotline necessitated collaboration with other organizations with additional expertise in treating patients with opioid use disorder. This led to a collaboration with the National Clinical Consultation Center's Substance Use Warmline. This collaboration allows us to better respond to non-emergent calls (e.g., questions regarding buprenorphine maintenance or buprenorphine for chronic pain) and to help further support CPCS staff with more complex calls or calls that we lacked the required resources (e.g., assistance with linkage to care). Together, both entities were and are currently able to answer all calls that reach the hotline [15, 16].

A consultation service such as CPCS-Bridge has wide benefits. First, the hotline equips specialist staff with a new skill in treating patients with opioid withdrawal and addiction, which only a small number of our staff had previous experience with. Furthermore, in the fourth quarter of 2019, the hotline received 149 calls, which does not adequately describe the consultations' reach. If after each call, an emergency department clinician is then equipped with information regarding the initiation of medications for opioid withdrawal, they are likely to incorporate the learned knowledge into day-to-day practice.

Limitations

Several limitations of our survey design warrant attention. First, the survey was not a validated tool as there were no pre-existing published surveys available to us regarding attitudes and perceptions of poison center staff. The number of respondents was small and may be due to the voluntary nature of the survey project. Since it was only deployed electronically, those without a computer or smartphone could not access it prior to the training. In addition, this study only includes specialists from a single US state. Therefore, the generalizability to other US poison centers is limited. As mentioned previously, a majority of CPCS specialists have a

background in pharmacy (PharmD), while other poison centers may have different staffing models (e.g., all staff with a background in nursing). In addition, the CPCS model is a unique system of four separate divisions working in conjunction as an integrated system, and with the capacity to scale and serve the entire state of California with the creation of CPCS-Bridge. While it is certainly feasible to create a similar hotline at other poison centers, the impact and population served may be substantially smaller. Finally, response bias could also have impacted the results even though participation was anonymous. For example, less confident specialists may have been less likely to support the program or those with negative perceptions regarding treating patients with opioid use disorder may not have wanted to disclose such opinions.

Limitations of the CPCS-Bridge hotline include a relatively low number of calls in comparison with the number of calls received daily by the poison control center. This is likely due to the limited advertisement of the hotline during the pilot period. In addition, providers may not have called the line when initiating buprenorphine treatment if they did not need assistance, felt uncomfortable with using a new remote service, or an in-facility addiction medicine specialist was available as a resource.

Conclusion

In 2018, CPCS successfully created a hotline to assist frontline health care providers in treating patients with opioid use disorder and highlights the critical role of poison centers in the public health domain. Increased federal funding to poison centers and support in expanding the current poison center model, particularly in our dire opioid epidemic, is likely to be mutually beneficial to all parties involved.

Acknowledgments The authors would like to express gratitude to all CPCS San Francisco staff and managing directors, medical directors, and staff at CPCS divisions in Fresno, Sacramento, and San Diego, all of whom contributed to the success of this pilot implementation.

Funding All authors previously received funding with grants from the California HealthCare Foundation (grant #20656) and the California Department of Health Care Services (grant #18-95126). All authors are currently receiving funding with a grant from the California Department of Health Care Services (grant #18-95407).

Compliance with Ethical Standards

Conflict of Interest None.

References

1. California MAT Expansion Project. Available at: <https://californiamat.org/about/>. Accessed 11 May 2020.

2. California Bridge Program. Available at: <https://www.bridgetotreatment.org/>. Accessed 12 May 2020.
3. Zaloshnia E, Miller T, Jones P, Litovitz T, et al. The potential impact of poison control centers on rural hospitalization rates for poisoning. *Pediatrics*. 2006;118(5):2094–100.
4. Zaloshnia E, Miller T, Jones P, Litovitz T, et al. The impact of poison control centers on poisoning-related visits to EDs – United States, 2003. *Am J Emerg Med*. 2008;26(3):310–5.
5. Miller TR, Lestina DC. Costs of poisoning in the United States and savings from poison control centers: a benefit-cost analysis. *Ann Emerg Med*. 1997;29:239–45.
6. Vassilev ZP, Marcus SM. The impact of a poison control center on the length of hospital stay for patients with poisoning. *J Toxicol Environ Health: Part A*. 2007;70(2):107–10.
7. Bunn TL, Slavova S, Spiller HA, Colvin J, Bathke A, Nicholson VJ. The effect of poison control center consultation on accidental poisoning inpatient hospitalizations with preexisting medical conditions. *J Toxicol Environ Health A*. 2008;71:283–8.
8. LoVecchio F, Curry S, Waszolek K, Klemens J, et al. Poison control centers decrease emergency healthcare utilization costs. *J Med Toxicol*. 2008;4(4):221–4.
9. The Arizona Opioid Assistance and Referral (OAR) Line. Available at: <https://www.maricopa.gov/DocumentCenter/View/53078/OAR-Line-Info>. Accessed 14 May 2020.
10. Nation’s First Opioid Helpline Launches in Arizona. Available at: <https://uanews.arizona.edu/story/nation-s-first-opioid-helpline-launches-arizona>. Accessed 14 May 2020.
11. Rounsaville BJ, Kleber HD. Untreated opiate addicts: how do they differ from those seeking treatment? *Arch Gen Psychiatry*. 1985;43:739–45.
12. Montoya ID, Shroeder JR, Preston KL, Covi L, et al. Influence of psychotherapy attendance on buprenorphine treatment outcome. *J Subst Abus Treat*. 2005;28:247–54.
13. Kosten TR, O’Connor PG. Current concepts – management of drug withdrawal. *N Engl J Med*. 2003;348:1786–95.
14. Strayer RJ, Hawk K, Hayes BD, Herring AA, Ketcham E, LaPietra AM, et al. Management of opioid use disorder in the emergency department: a white paper prepared for the American Academy of Emergency Medicine. *J Emerg Med*. 2020;58(3):522–46.
15. National Clinical Consultation Center. Substance Use Resources. Available at: <https://nccc.ucsf.edu/clinical-resources/substance-use-resources/>. Accessed 15 May 2020.
16. National Clinical Consultation Center. California Substance Use Line. Available at: <https://nccc.ucsf.edu/clinician-consultation/substance-use-management/california-substance-use-line/>. Accessed 15 May 2020.

Publisher’s Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.