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The Opioid-overdose Reduction Continuum of Care Approach (ORCCA): Evidence-based practices in the HEALing Communities Study

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ABSTRACT

Background: The number of opioid-involved overdose deaths in the United States remains a national crisis. The HEALing Communities Study (HCS) will test whether Communities That HEAL (CTH), a community-engaged intervention, can decrease opioid-involved deaths in intervention communities (n = 33), relative to wait-list communities (n = 34), from four states. The CTH intervention seeks to facilitate widespread implementation of three evidence-based practices (EBPs) with the potential to reduce opioid-involved overdose fatalities: overdose education and naloxone distribution (OEND), effective delivery of medication for opioid use disorder (MOUD), and safer opioid analgesic prescribing. A key challenge was delineating an EBP implementation approach useful for all HCS communities.

Methods: A workgroup composed of EBP experts from HCS research sites used literature reviews and expert consensus to: 1) compile strategies and associated resources for implementing EBPs primarily targeting individuals 18 and older; and 2) determine allowable community flexibility in EBP implementation. The workgroup developed the Opioid-overdose Reduction Continuum of Care Approach (ORCCA) to organize EBP strategies and resources to facilitate EBP implementation.

Conclusions: The ORCCA includes required and recommended EBP strategies, priority populations, and community settings. Each EBP has a "menu" of strategies from which communities can select and implement with a minimum of five strategies required: one for OEND, three for MOUD, and one for prescription opioid safety. Identification and engagement of high-risk populations in OEND and MOUD is an ORCCArequirement. To ensure

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CTH has community-wide impact, implementation of at least one EBP strategy is required in healthcare, behavioral health, and criminal justice settings, with communities identifying particular organizations to engage in HCS-facilitated EBP implementation.

1. Background

The high number of deaths from opioids has been declared a public health crisis in the United States (Gostin et al., 2017). More than 450, 000 people died from an opioid overdose from 1999 to 2018, with nearly 47,000 deaths in 2018 alone (Wilson et al., 2020). The Helping End Addictions Long Term (HEALing) Healing Communities Study (HCS), jointly supported by the National Institutes of Health and the Substance Abuse and Mental Health Services Administration (SAMHSA), will test the ability of the Communities That HEAL (CTH) intervention to decrease opioid-involved deaths in communities from four research sites, located in Kentucky, Massachusetts, New York, and Ohio. The CTH intervention follows a community engagement framework, modeled in part on the evidence-based Communities That Care model, which assists communities in adopting evidence based practices (EBPs) to prevent drug use (Hawkins et al., 2009). The CTH intervention seeks to promote a common vision, shared goals, and tailored strategies to mobilize HCS communities to adopt and implement EBPs using a stepwise community change process integrating three components: 1) community engagement; 2) the Opioid-overdose Reduction Continuum of Care Approach (ORCCA); and 3) communication campaigns to increase awareness and demand for EBPs and to reduce stigma (The HEALing Communities Study Consortium, 2020).

To reduce opioid-involved overdose fatalities, three EBPs, primarily targeting individuals 18 and older, will be promoted as part of the ORCCA: 1) overdose education and naloxone distribution (OEND); 2) effective delivery of medication for opioid use disorder (MOUD), including agonist / partial agonist medication; and 3) prescription opioid safety. Naloxone is an opioid overdose antidote that works by blocking and displacing opioid agonists at the mu opioid receptor within seconds after administration. OEND was developed as a harm-reduction strategy by communities of people who use opioids and advocacy agencies in the late 1990s empowering people who use drugs and their social networks to rescue people who overdose (Dettmer et al., 2001; Maxwell et al., 2006). While no community-level randomized controlled trials have been completed, several quasi-experimental studies have demonstrated that opioid-involved overdose death rates and emergency department visits have decreased in communities where people receive OEND compared to those that do not (Bird et al., 2016; Clark et al., 2014; Coffin et al., 2016; Giglio et al., 2015; McDonald and Strang, 2016; Walley et al., 2013b). As a result, OEND is recommended as a key strategy to address opioid overdose by the U.S. Department of Health and Human Services (US Department of Health and Human Services, 2018), the World Health Organization (World Health Organization, 2014), the American Medical Association (American Medical Association, 2018), the American Society of Addiction Medicine (American Society of Addiction Medicine, 2016), and the American Pharmacists Association (American Pharmacists Association, 2019). In July 2020, the Food and Drug Administration (FDA) announced that it is requiring opioid pain medicine and MOUD labeling to be updated to include the recommendation that health care professionals discuss the availability of naloxone with patients and caregivers as a routine part of prescribing the medications (Food and Drug Administration, 2020).

Methadone and buprenorphine, two of the three FDA-approved medications for treating opioid use disorder (OUD), decrease all-cause and overdose mortality for persons with OUD (Larochelle et al., 2018; Pearce et al., 2020; Sordo et al., 2017). There is insufficient evidence to draw conclusions about the impact of naltrexone (specifically, extended-release naltrexone), the third FDA-approved medication for treating OUD, on mortality reduction (Jarvis et al., 2018; Larochelle et al., 2018). A meta-analysis of cohort studies including 122,885 people treated with methadone found overdose mortality rates of 2.6 per 1000 person years for individuals in methadone treatment compared to 12.7 for those without treatment (Sordo et al., 2017). A meta-analysis of cohort studies including 15,831 people treated with buprenorphine revealed overdose mortality rates of 1.4 per 1000 person-years for individuals being treated with buprenorphine compared to 4.6 for individuals not in treatment (Sordo et al., 2017). A recent cohort study of 55,247 individuals receiving methadone or buprenorphine found that the risk of death when not taking MOUD was 2.1 times the risk of death when taking MOUD (Pearce et al., 2020). Notably, the relative risk of death while not taking MOUD increased to 3.4 times that when taking MOUD after illicit fentanyl became more widespread (Pearce et al., 2020). In addition, a study of 17,568 opioid-involved overdose survivors found that methadone and buprenorphine were associated with decreased all-cause and opioid overdose mortality in the first year after the nonfatal overdose (Larochelle et al., 2018). Despite evidence indicating the effectiveness of methadone and buprenorphine for the treatment of OUD and reduction of opioid-involved overdose events, they are widely underutilized. The National Survey on Drug Use and Health (NSDUH) estimates that 2.1 million Americans have OUD, yet fewer than 20 % of those individuals receive addiction care in a given year (Substance Abuse and Mental Health Services Administration, 2019a; Wu et al., 2016). In a cohort of opioid overdose survivors, fewer than one-third received any MOUD within a year of the overdose event (Larochelle et al., 2018). Further, protection against overdose depends on adherence to MOUD but rates of MOUD discontinuation are high (Samples et al., 2018; Wakeman et al., 2020) with risk of overdose increasing after MOUD discontinuation (Wakeman et al., 2020; Williams et al., 2020). There are multiple reasons for this treatment gap (Williams et al., 2018) including the failure of EBPs to penetrate community settings that encounter people at the highest risk for overdose.

Increased opioid analgesic prescribing beginning in the 1990s played a well-documented role in fomenting the U.S. opioid epidemic. In 2001, the Joint Commission introduced standards to improve care of patients with pain (Phillips, 2000), and pain became recognized as the 5th vital sign (Veterans Health Administration, 2000). Aggressive marketing of opioids followed, promising relief from pain while minimizing adverse effects associated with opioid analgesics (Van Zee, 2009). By 2012, use of opioid analgesics was widespread, with an average of 81 opioid analgesic prescriptions dispensed per 100 persons in the US (Centers for Disease Control and Prevention, 2020b). As opioid analgesic prescribing surged, the prevalence of OUD and opioid overdose increased (Paulozzi et al., 2011). In response to the OUD and opioid overdose crisis, policies to curb prescription opioid use and diversion were implemented. Prescription Drug Monitoring Programs, state-mandated programs that collect and report information on the dispensing of controlled substances, are now established in all 50 states and the District of Columbia. Their implementation has been associated with decreased opioid prescribing, reductions in high-risk prescribing practices, and fewer episodes of “doctor-shopping” (Strickler et al., 2019). In 2016, in an effort to promote safer use of opioid analgesics, the US Centers for Disease Control and Prevention (CDC) released guidelines for prescribing opioids for chronic pain (Dowell et al., 2016). Key points in the guideline include recommendations to use non-pharmacologic and non-opioid therapies as 1st line treatment for chronic pain, to use caution when escalating opioid doses or prescribing high-risk drug combinations, and to limit the duration of opioid therapy for acute pain. As efforts to prevent OUD and overdose continue, strategies to reduce unnecessary prescribing and limit excess opioid analgesics in communities remain

important.

In order to promote OEND, effective delivery of MOUD, and safer opioid prescribing the study team developed an approach to EBP implementation with utility for all participating communities, which vary widely in their current EBP implementation, access to resources including needed workforce, and perceived acceptability of various EBPs. This paper describes the framework developed to guide EBP selection and implementation strategies contained in the Opioid-overdose Reduction Continuum of Care Approach.

2. Methods/design

For each EBP component of the CTH intervention, a workgroup consisting of EBP experts from each research site was established to develop an approach that would include standardization requirements across communities, while also providing enough flexibility to meet the varying needs of the 67 HCS communities. A significant reduction in opioid-involved overdose deaths will require widespread implementation of OEND, effective delivery of MOUD, and prescription opioid safety efforts. Therefore, effective implementation of strategies for each of these three EBPs is an HCS goal. The first task undertaken by this workgroup was developing a framework for organizing the targeted EBPs and potential strategies for their implementation. The Opioid-overdose Reduction Continuum of Care Approach (ORCCA), shown in Fig. 1, was adapted from the Cascades of Care for OUD developed by Williams and colleagues (Williams et al., 2018). Cascades of Care emphasizes four domains: Prevention, Identification, Treatment, and Remission. The ORCCA places greater emphasis on the HCS-goal of implementing EBP strategies that will reduce opioid-involved overdose fatalities and demonstrates how overdose reduction strategies overlap across a continuum of care rather than being discrete steps. The workgroup then developed the ORCCA's required elements and a companion Technical Assistance Guide referencing existing resources to assist communities with implementation. Based on research literature and expert consensus, the ORCCA includes required and recommended community settings, priority populations, EBPs, and implementation strategies.

2.1. Required community settings

In order to ensure the CTH intervention has impact across multiple sectors interacting with individuals at high risk for an opioid-involved overdose and across the care continuum, each community is required to implement at least one of the EBPs within each of three community settings: 1) healthcare; 2) behavioral health; and 3) criminal justice. Healthcare settings include outpatient healthcare centers, pre-hospital providers, emergency departments and urgent care, hospitals, primary care settings, and pharmacies. Behavioral health includes substance use disorder and mental health treatment centers and social service agencies. Criminal justice includes pre-trial, jails, probation, parole, drug and problem-solving courts, police and "narcotics" task forces, halfway houses, community-based correctional facilities, and department of youth services. Communities provide a rationale for not engaging all three community settings.

2.2. High risk populations

Most people with OUD in the U.S. are not enrolled in effective treatment (Williams et al., 2018). Any individual misusing opioids or with OUD is at risk for opioid-involved overdose death, particularly if not engaged in MOUD. A substantial proportion of people who die from opioid-involved overdose have had no interaction with the healthcare system in the previous year (Larochelle et al., 2019). Thus, reducing overdose deaths will require engaging people who currently are not accessing overdose prevention or OUD treatment services. This reality is the justification for an ORCCA requirement to identify and intervene with high-risk populations. Individuals who are at highest risk for overdose, such as those who have overdosed or those who recently were

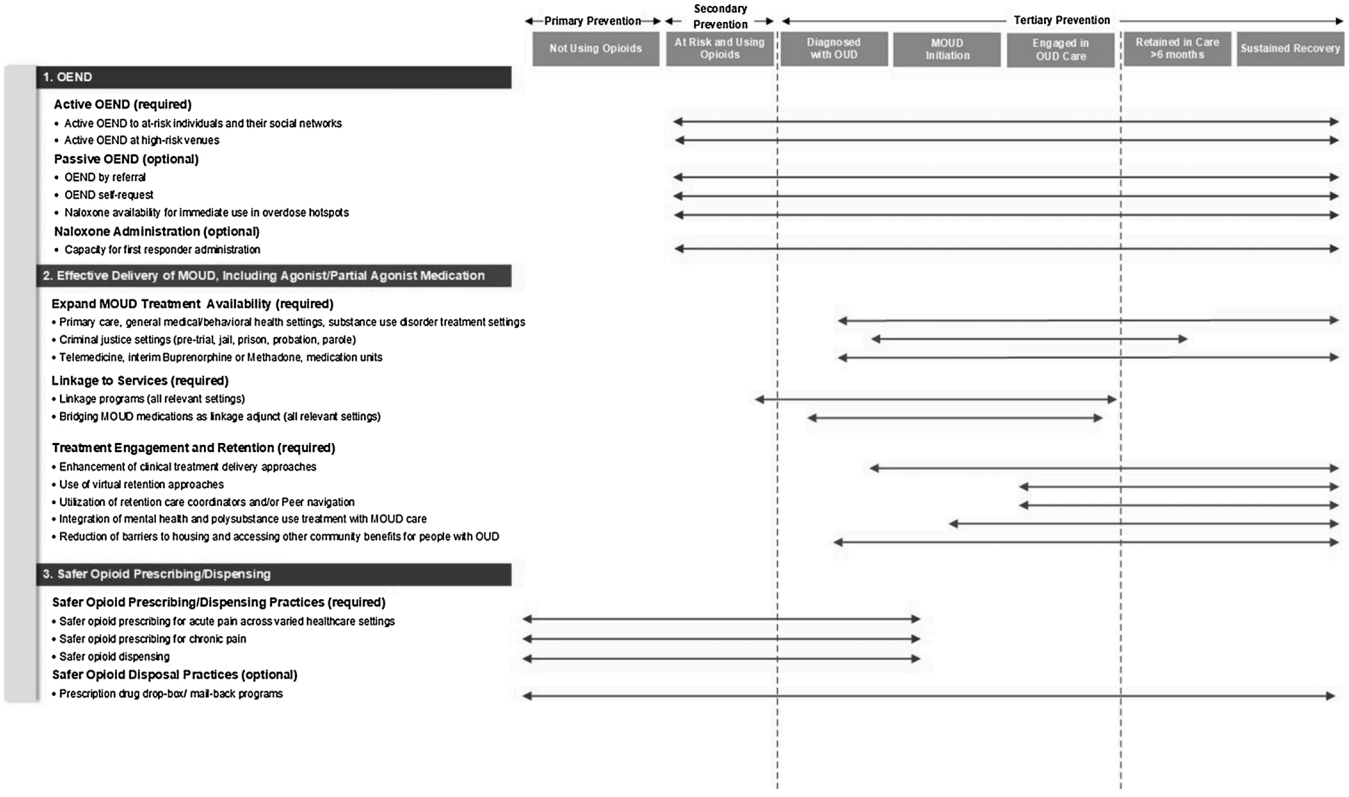

Fig. 1. The HEALing Communities Study Opioid-overdose Reduction Continuum of Care Approach (ORCCA) with Sample strategies.

treated in a withdrawal management program (colloquially referred to as "detox"), do not typically access MOUD (Larochelle et al., 2018; Walley et al., 2020). Specific factors that further elevate the risk of overdose among those using opioids include: 1) having had a prior opioid overdose (Caudarella et al., 2016; Darke et al., 2011; Larochelle et al., 2018; Larochelle et al., 2019; Winhusen et al., 2016); 2) having reduced opioid tolerance (e.g., completing medically supervised or "socially" managed withdrawal, or release from an institutional setting such as jail, residential treatment, hospital) (Binswanger et al., 2007; Larochelle et al., 2019; Merrall et al., 2010; Strang et al., 2003; Walley et al., 2020); 3) using other substances (e.g., alcohol, benzodiazepines, stimulants) (Brugal et al., 2002; Cho et al., 2020; Gladden et al., 2019; Larochelle et al., 2019; Park et al., 2020, 2015; Sun et al., 2017); 4) having a concomitant major mental illness (e.g., major depression, bipolar disorder, schizophrenia, anxiety disorders) (O'Driscoll et al., 2001; Pabayo et al., 2013; Tobin and Latkin, 2003; Wines et al., 2007); 5) having a concomitant major medical illness (e.g., cirrhosis, chronic kidney disease, COPD, asthma, sleep apnea, congestive heart failure; infections related to drug use) (Bosilkovska et al., 2012; Green et al., 2012; Jolley et al., 2015; Larochelle et al., 2019; Vu et al., 2018); and/or 6) injecting drugs (Bazazi et al., 2015; Brugal et al., 2002).

In developing the ORCCA, the workgroup delineated three approaches to identifying high risk populations (See Table 1). These approaches include: 1) identification within criminal justice settings and venues where high-risk populations seek services (Green et al., 2018; Malta et al., 2019; Park-Lee et al., 2016; Suffoletto and Zeigler, 2020; Weiner et al., 2020), 2) field-based outreach including point-of-contact for emergency response (, Bagley et al., 2019; Waye et al., 2019), and 3) the use of surveillance or other existing data sources to locate individuals likely needing intervention (Formica et al., 2018; Merrick et al., 2016). In the first approach, EBPs are incorporated into services at venues where people at high-risk may be present. The second approach includes real-time community outreach to high-risk venues and individuals. The third approach includes identifying newly emerging risk groups utilizing overdose surveillance data. In addition to defining populations at high risk for overdose, the ORCCA also identifies populations that would likely warrant tailoring EBP strategy implementation. These groups include adolescents (Bagley et al., 2020; Chatterjee et al., 2019; Lyons et al., 2019), pregnant and post-partum women (Goldman-Mellor and Margerison, 2019; Nielsen et al., 2020), homeless populations (Bartholomew et al., 2020; Doran et al., 2018; Magwood et al., 2020), rural populations without transportation (Arcury et al., 2005; Bunting et al., 2018) and other factors related to poverty (Snider et al., 2019; Song, 2017), veterans (Lin et al., 2019; Mudumbai et al., 2019), non-English speaking and immigrant populations (Salas-Wright et al., 2014; Singhal et al., 2016), racial and ethnic minorities (Barocas et al., 2019; Lippold et al., 2019), people with mental health disorders (Turner and Liang, 2015) and mental/physical disabilities (Burch et al., 2015; West et al., 2009), people involved in transactional sex (Goldenberg et al., 2020; Marchand et al., 2012), and people who have chronic

Table 1
Identification of populations at heightened risk for opioid-involved overdose death.

Identification locations	Sample methods/resources
	1) Criminal justice and service venues: Identification procedures
1) Criminal justice settings 2) Syringe service programs 3) Health-care facilities 4) First responder stations (e.g., police and fire stations) 5) Addiction treatment and recovery facilities 6) Mental/behavioral health treatment facilities 7) Community-based social service agencies 8) Hotline (phone or internet) responding to service requests	o Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) (McNeely et al., 2016a) o Single-item Drug Screening Question (Smith et al., 2010) o TAPS Tool (Tobacco, Alcohol, Prescription Medication and Other Substance Use) (McNeely et al., 2016b; Schwartz et al., 2017) o Rapid Opioid dependence screen (RODS) (Wickersham et al., 2015) o Prescription Drug Monitoring Program systems (Huizenga et al., 2016) o Screening-provider directed (Donofrio and Degutis, 2010) o Electronic Health Record prompted screening and automated algorithms (Lo-Ciganic et al., 2019; Schechter-Perkins et al., 2018; Webster and Webster, 2005) o Identification of family members (U.S. Department of Health and Human Services, Health Resources and Services Administration, 2018) o SAMHSA "Now What? The Role of Prevention Following a Nonfatal Opioid Overdose" (SAMHSA Center for the Application of Prevention Technologies, 2018) o Opioid Risk Tool (Webster and Webster, 2005) o Risk Index for Overdose or Serious Opioid-induced Respiratory Depression (Yates et al., 2018) o Screening for Adolescents (Kelly et al., 2014; Levy et al., 2014) o SAMHSA for Screening in Pregnant Women (Substance Abuse and Mental Health Services Administration, 2018a) o Screening for Drug Use in General Medical Settings (National Institute on Drug Abuse, 2014b)
	2) Outreach: Field-based population detection methods
1) Point of contact during 911 (emergency telephone number in North America) call 2) Peer/social networking 3) Community outreach initiatives/ events 4) Mobile vans	o Post opioid overdose outreach by public health and public safety agencies (Bagley, S. M. et al., 2019) o Emerging programs in Massachusetts (Formica et al., 2018) o Accessing Social Networks (Kimbrough et al., 2009) o AnchorED (Bagley et al., 2019; The Providence Center, 2019; Waye et al., 2019) o Police Assisted Addiction Recovery Initiative (Schiff et al., 2017) o Relay, a peer-delivered response to nonfatal opioid overdoses (Welch et al., 2019) o Recovery Initiation and Management after Overdose (Scott et al., 2020, 2018) o Mobile Recovery Outreach Teams (Wagner et al., 2019) o Opioid Overdose Reversal Program (Powell et al., 2019)
	3) Surveillance and Other Records Systems: rapid and/or proactive use of existing data to target populations and detect "outbreaks"
1) Non-fatal overdose records (911 calls/EMS; ED encounters) 2) Records of people having called service systems/hotlines 3) Frequent use of other health services 4) Substance Use Disorder/Mental Health treatment records 5) Records of individuals encountering law enforcement	o Colerain (Cincinnati) Quick Response Teams (Merrick et al., 2016) o SAMHSA "Now What? The Role of Prevention Following a Nonfatal Opioid Overdose" (SAMHSA Center for the Application of Prevention Technologies, 2018) o Emerging post-overdose outreach programs in Massachusetts (Formica et al., 2018)

Footnotes. SAMHSA = Substance Abuse and Mental Health Services Administration; EMS = Emergency medical services; ED = Emergency department.

Table 2
Strategies and sample resources to increase opioid overdose prevention education and naloxone distribution (OEND).

Strategies	Sample Resources
Active OEND for at-risk individuals and their social networks (Bagley et al., 2018, 2015; Behar et al., 2015; Coe and Walsh, 2015; Coffin and Sullivan, 2013; Commonwealth Medicine: University of Massachusetts Medical School, 2018; Doe-Simkins et al., 2014; Jones et al., 2014; McAuley et al., 2015; Mueller et al., 2015; Simmons et al., 2018; Vissman et al., 2017; Voss et al., 2013; Walley et al., 2013a) **Active OEND at high-risk venues:** Criminal Justice settings (Binswanger et al., 2007; Merrall et al., 2010; Vissman et al., 2017; Vissman et al., 2020) Syringe service program (Bennett et al., 2018) Emergency departments and acute care hospitals (Dwyer et al., 2015) "Leave behind" programs at sites of overdose (Bagley et al., 2019; Formica et al., 2018) Mental Health/Addiction treatment programs (Walley et al., 2013a)	a) **Active OEND (required)** General Overview/Introduction to Active OEND o Harm Reduction Coalition (Harm Reduction Coalition, 2019b) o SAMHSA: Opioid Overdose Prevention Toolkit: Opioid Use Disorder Facts (Substance Abuse and Mental Health Services Administration, 2018b) o CDC: Evidence-Based Strategies for Preventing Opioid Overdose: *What's Working in the United States* (Centers for Disease Control and Prevention, 2018a) o Prescribe to Prevent (Prescribe to Prevent, 2020) o Prevent & Protect (Prevent and Protect, 2020) o Naloxone Access Laws – Prescription Drug Abuse Policy System (Prescription Drug Abuse Policy System, 2019) o Cost-Effectiveness of Intranasal Naloxone Distribution (Acharya et al., 2020) o Association of Take-Home Naloxone and Opioid Overdose Reversal (Katzman et al., 2020) o How to Use Naloxone Video Resource (University of Kentucky, 2020) Active OEND at high-risk venues o Criminal Justice Settings o A Primer for Implementation of OEND Programs in Jails and Prisons (Harm Reduction Coalition, 2019c) o Bureau of Justice Assistance: Law Enforcement Naloxone Toolkit (Bureau of Justice Assistance National Training and Technical Assistance Center, 2018) o Staying Alive on the Outside Post-Incarceration Video (Center for Prisoner Health and Human Rights, 2020) o Syringe Service Programs o Syringe Service Program Fact Sheet and FAQs (Centers for Disease Control and Prevention, 2019c) o Emergency Department and Acute Care Hospitals o Prescribe to Prevent webpage for Emergency Medicine Providers (Prescribe to Prevent, 2017) o AnchorED (The Providence Center, 2019) o Resource for Emergency Department naloxone distribution (American College of Emergency Physicians, 2014) State-specific Resources for Active OEND o Kentucky o Stop Overdoses (Kentucky Office of Drug Control Policy, 2020) o Pharmacist Association Mobile Pharmacy OEND Program (Kentucky Pharmacists Association, 2019) o Kentucky Cabinet for Health and Family Services: Syringe exchange programs (Kentucky Cabinet for Health and Family Services, 2019) o Massachusetts o Naloxone Information and Resources (Commonwealth Medicine: University of Massachusetts Medical School, 2018) o Learn to Cope (Learn to Cope, 2020) o OEND Program Core Competencies (Massachusetts Department of Public Health, 2019) o Guidelines for Overdose Education and Naloxone Distribution Programs (Massachusetts Department of Public Health, 2018) o Post opioid overdose outreach by public health and public safety agencies: Exploration of emerging programs (Formica et al., 2018) o Plymouth County Outreach (Plymouth County District Attorney's Office, 2019) o "Leave behind" Programs at Sites of Overdose: Hampshire Hope Drug Addiction and Recovery Team (Hampshire HOPE, 2020) o Practice Guidance for integrating Overdose Prevention into Addiction Treatment (Massachusetts Bureau of Substance Addiction Services, 2015) o Praxis: Overdose Prevention Training for Massachusetts Addiction Professionals (C4 Innovations, 2015) o New York

(*continued on next page*)

Table 2 (*continued*)

Strategies	Sample Resources
	o Opioid Overdose prevention programs (New York State Department of Health, 2020b) o How to become a registered opioid overdose prevention program (New York City Health, 2020b) o Authorized Syringe Access and Disposal Programs (New York State Department of Health, 2020c) o New York Skills and Knowledge of Overdose Prevention (Harm Reduction Coalition, 2019a) o Relay, a peer-delivered response to nonfatal opioid overdoses (Welch et al., 2019) o Ohio o Project DAWN (Ohio Department of Health, 2020) o Post –Entry –Exit and Recovery Overdose Prevention Programs (Vissman et al., 2017)
OEND by referral (e.g. prescription to fill at pharmacy (Green et al., 2015; Guy et al., 2019; Mueller et al., 2015), **referral to OEND dispensing program (**Coffin et al., 2016; Sohn et al., 2019)	b) **Passive OEND (optional)** General Resources/Toolkits for OEND by referral and OEND by self-request o Prescribe to Prevent (Lim, J. K. et al., 2016; Prescribe to Prevent, 2020) o GetNaloxoneNow.org training (Simmons et al., 2018) o Prevent & Protect: Pharmacy Outreach to improve community naloxone access (Prevent and Protect, 2020) o Naloxone Overdose Prevention Laws (Prescription Drug Abuse Policy System, 2019) o NEXT Naloxone (NEXT Harm Reduction, 2020) o Implementation Evaluation of Academic Detailing on Naloxone Prescribing (Bounthavong et al., 2019) State-Specific Resources for OEND by referral and OEND by self-request o Kentucky • Stop Overdoses (Kentucky Office of Drug Control Policy, 2020) • Kentucky Cabinet for Health and Family Services: Syringe exchange programs (Kentucky Cabinet for Health and Family Services, 2019) o Massachusetts • Information for Community Members About How to Get Naloxone (Massachusetts Department of Public Health, 2020) • Prescribing Naloxone and Access to Pharmacy Naloxone (Massachusetts Technical Assistance Partnership for Prevention, 2020) o New York • Availability of Naloxone in Pharmacies (New York State Department of Health, 2020a) • New York Naloxone Availability Mobile App (New York City Health, 2020a) o Ohio • Pharmacy Naloxone Resources (State of Ohio Board of Pharmacy, 2020a)
OEND self-request (e.g. at pharmacy, community meeting or public health department) (Jones et al., 2016)	
Naloxone availability for immediate use in overdose hotspots (NaloxBox, 2020; Salerno et al., 2018)	NaloxBox (mounted supply of naloxone) (NaloxBox, 2020) Prevent & Protect Safety Policy (Prevent and Protect, 2020) Health Resources in Action: Overdose Response Training (Health Resources in Action, 2017)
Capacity for first responder administration (Davis et al., 2015, 2014a; Davis et al., 2014b; Rando et al., 2015)	c) **Naloxone administration (optional)** General Resources/Toolkits o SAMHSA: Opioid Overdose Prevention Toolkit: Five Essential Steps for First Responders (Substance Abuse and Mental Health Services Administration, 2016) o GetNaloxoneNow.org training (Simmons et al., 2018) o Bureau of Justice Assistance: Law Enforcement Naloxone Toolkit (Bureau of Justice Assistance National Training and Technical Assistance Center, 2018) State-generated Resources o Massachusetts First Responder Naloxone Technical Assistance (Massachusetts Technical Assistance Partnership for Prevention, 2020) o Massachusetts Bulk Purchasing of Naloxone for Municipalities (Massachusetts State Office of Pharmacy, 2020) o New York State Department of Health Availability of Naloxone in Pharmacies (New York State Department of Health, 2020a) o New York Naloxone Availability Mobile App (New York City Health, 2020a) o Ohio's Project DAWN (Ohio Department of Health, 2020)

Footnotes. OEND = Opioid overdose prevention education and naloxone distribution; SAMHSA = Substance Abuse and Mental Health Services Administration; CDC = Centers for Disease Control and Prevention; DAWN = Deaths avoided with naloxone.

Table 3
Strategies and sample resources to enhance delivery of medication for opioid use disorder (MOUD) maintenance treatment.

Strategies	Sample Resources
Adding/expanding MOUD treatment in primary care, other general medical and behavioral/mental health settings (Brooklyn and Sigmon, 2017; Heinzerling et al., 2016; National Academies of Sciences Engineering and Medicine et al., 2019; Townley and Dorr, 2017) and in specialty addiction/ substance use disorder treatment settings and recovery programs (Clark et al., 2010; SAMHSA-HRSA Center for Integrated Health Solutions, 2014)	a) **Expand MOUD Treatment Availability (Capacity building; required)** • Providers Clinical Support System SUD 101 Curriculum (Providers Clinical Support System, 2019b) • National Academy for Science, Engineering and Medicine: Medication for Opioid Use Disorder Saves Lives (National Academies of Sciences Engineering and Medicine et al., 2019) • Comparative Effectiveness of Different Treatment Pathways for Opioid Use Disorder (Wakeman et al., 2020) • Clinical Guidelines for Use of Depot Buprenorphine in the Treatment of Opioid Dependence (New South Wales Ministry of Health, 2019) • Providers Clinical Support System Primer on Antagonist-Based Treatment of Opioid Use Disorder in the Office Setting (Providers Clinical Support System, 2017b) • SAMHSA: Clinical use of extended-release injectable naltrexone in the treatment of Opioid Use Disorder: A Brief Guide (Substance Abuse and Mental Health Services Administration, 2015a) • American Academy of Addiction Psychiatry, State Targeted Response Technical Assistance Consortium Opioid Response Network (American Academy of Addiction Psychiatry and State Targeted Response Technical Assistance Consortium, 2018) • Project ECHO (Boston Medical Center, 2019b; Northeast Ohio Medical University, 2019; Project ECHO Cincinnati, 2019; University of New Mexico, 2019) • SAMHSA Buprenorphine Practitioner Locator (Substance Abuse and Mental Health Services Administration, 2020b) • American Society of Addiction Medicine: *Live & Online CME Trainings* (American Society of Addiction Medicine, 2019a) • Harvard Medical School free, accredited online courses in Opioid Use Disorder Education o Understanding Addiction (Harvard Medical School CME Online, 2017c) o Identification, Counseling, and Treatment of OUD (Harvard Medical School CME Online, 2017b) o Collaborative Care Approaches for the Management of OUD (Harvard Medical School CME Online, 2017a) • MOUD Implementation Checklist (SAMHSA-HRSA Center for Integrated Health Solutions, 2020) • Expanding the Use of Medications to Treat Individuals with Substance Use Disorders (SAMHSA-HRSA Center for Integrated Health Solutions, 2014) • Procedures for Medication-Assisted Treatment of Alcohol or Opioid Dependence in Primary Care (Heinzerling et al., 2016) • Getting Started with MOUD with Lessons from Advancing Recovery (Clark et al., 2010) • SAMHSA TIP 63: Medications for OUD (Substance Abuse and Mental Health Services Administration, 2020d) • SAMHSA MAT Guide for Pregnant Women with OUD (Substance Abuse and Mental Health Services Administration, 2018a) • SAMHSA TIP 42: Substance Abuse Treatment for Persons with Co-Occurring Disorders (Substance Abuse and Mental Health Services Administration, 2020f) • American Psychological Association: The Opioid Guide (American Psychological Association Cross-Divisional Taskforce on Clinical Responses to the Opioid Crisis, 2019) • Integrating Buprenorphine Treatment for OUD in Primary Care (Cunningham and Lum, 2017) • Medication-assisted treatment models of care for opioid use disorder in primary care settings (Chou et al., 2016b) • Boston Medical Center Office Based Addiction Treatment TTA and Addiction CHAT Live (Boston Medical Center, 2019a) • SAMHSA Apply for a Practitioner Waiver (Substance Abuse and Mental Health Services Administration, 2020a) • American Academy of Addiction Psychiatry 8 h and 24 h Waiver Training (American Academy of Addiction Psychiatry, 2019) • American Society of Addiction Medicine Waiver Qualifying Training (American Society of Addiction Medicine, 2019c) • Providers Clinical Support System Overview of Medication Assisted Treatment (Providers Clinical Support System, 2020b) • Provider Clinical Support System Mentoring Program (Providers Clinical Support System, 2020c) • Boston Medical Center Office Based Addiction Treatment Clinical Tools and Forms (Boston Medical Center, 2019d) • California Bridge (California Department of Health Care Services, 2018) and Project "Support for Hospital Opioid Use Treatment" (Project SHOUT and California Health Care Foundation, 2018) • Buprenorphine Home Induction smart phone application(Amston Studio LLC, 2019) • National Institute on Drug Abuse Home Induction guide (National Institute on Drug Abuse, 2019) • Boston Medical Center Addiction Chat Live (Boston Medical Center, 2018) • Continuum of Care ECHO: Inpatient treatment programs and Methadone providers (Boston Medical Center, 2019b) • Boston Medical Center Office Based Addiction Treatment Clinical Guidelines (Boston Medical Center, 2019c)

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Table 3 (*continued*)

Strategies	Sample Resources
	• American College of Emergency Physicians Addressing the Opioid Stigma in the Emergency Department (American College of Emergency Physicians, 2020b) • Initiating Buprenorphine treatment in detoxification settings (Stein et al., 2020) • Association between mortality rates and medication and residential treatment (Walley et al., 2020) • Institute for Health and Recovery Maternal Opioid Use During Pregnancy Toolkit (Institute for Health and Recovery Massachusetts Perinatal Quality Collaborative, 2018) • Adolescent Substance Use and Addiction Program – Primary Care (Levy et al., 2018) • Integrating BUP treatment in HIV primary care settings (Target HIV, 2019) • Case Western Intensive Course Series continuing medical education on controlled substance prescribing and buprenorphine (Case Western University School of Medicine, 2019)S tate-Specific Resources o Kentucky • Find Help Now Kentucky (Locate Addiction Specialty Clinics) (Find Help Now KY, 2020) o Massachusetts • Help Online (Locate Addiction Specialty Clinics) (The Massachusetts Substance Use Helpline, 2019) • Journey Recovery Project Pregnancy and Parenting (Journey Recovery Project, 2019) • Massachusetts Health Hospitals Association Guideline Treating Opioid Use Disorder in the Emergency Department (Massachusetts Health Hospital Association, 2019) • Protecting others and protecting treatment (Massachusetts Department of Public Health, 2016)
Adding/expanding MOUD treatment in Criminal Justice settings (e.g., pre-trial, jail, prison, probation, parole) (Binswanger, 2019; Green et al., 2018; Marsden et al., 2017; Moore et al., 2019; Rich et al., 2015)	• National Commission on Correctional Healthcare Jail-Based Medication-Assisted Treatment: Promising Practices, Guidelines, and Resources for The Field (National Commission on Correctional Healthcare, 2018) • SAMHSA: Use of Medication Assisted Treatment for Opioid Use Disorder in Criminal Justice Settings (Substance Abuse and Mental Health Services Administration, 2019e) • SAMHSA. Medication Assisted Treatment in the Criminal Justice System: Brief Guidance to the States. 2019 (Substance Abuse and Mental Health Services Administration, 2019b) • California Health Care Foundation Medication-Assisted Treatment in County Criminal Justice Settings Project (California Health Care Foundation, 2018) • American Society of Addiction Medicine Treatment in Correctional Settings Toolkit (American Society of Addiction Medicine, 2019b) • Principles of Drug Abuse Treatment for Criminal Justice Populations-A Research-Based Guide (National Institute on Drug Abuse, 2014a) • Protocol for Consent to Treatment with Medications for Opioid Use Disorder in Correctional Facilities (Massachusetts Bureau of Substance Addiction Services, 2019)
Expanding access to MOUD treatment through telemedicine, interim buprenorphine or methadone, or medication units	• Medication units: electronic-Code of Federal Regulations - 8.11 (Office of the Federal Register and Government Publishing Office, 2019b; Substance Abuse and Mental Health Services Administration, 2015b) • Interim methadone: electronic-Code of Federal Regulations – 8.11 (Newman, 2014; Office of the Federal Register and Government Publishing Office, 2019a; Schwartz et al., 2006) • Interim buprenorphine (Office of the Federal Register and Government Publishing Office, 2019b; Sigmon et al., 2016) • Low Barrier Tele-Buprenorphine (Harris et al., 2020) • MOUD Bridge Programs (Snow et al., 2019) • San Francisco Street Medicine Team (Carter et al., 2019) • Telemedicine&Prescribing Buprenorphine for the Treatment of Opioid Use Disorder (U.S. Department of Health and Human Services, 2018) • Project "Support for Hospital Opioid Use Treatment" Webinar on Telemedicine and MOUD Treatment (Project SHOUT and California Health Care Foundation, 2018)
Linkage Programs (all relevant settings)	b) **Interventions to Link to MOUD (required)** <u>Within (or initiated within) Service Settings</u> • Massachusetts Post-Overdose Public Health – Public Safety Partnerships (Formica et al., 2018) • SAMHSA "Now What? The Role of Prevention Following a Nonfatal Opioid Overdose" (SAMHSA Center for the Application of Prevention Technologies, 2018) • Police Assisted and Addiction Recovery Initiative (Schiff et al., 2017 • Community Reinforcement and Family Training (Center for Motivation and Change, 2014) • The 20 min Guide (Center for Motivation and Change, 2017) • The Foundation for Opioid Response Efforts (Foundation for Opioid Response Efforts, 2018) <u>Within Outreach/Field Settings</u> • Colerain (Cincinnati) Quick Response Teams (Merrick et al., 2016) • Safety and Health Integration in the Enforcement of Laws on Drugs (Arredondo et al., 2019) • Harmonizing Disease Prevention and Police Practice model (Silverman et al., 2012) • Bureau of Justice Assistance Law Enforcement Naloxone Toolkit (Bureau of Justice Assistance National Training and Technical Assistance Center, 2018) • Post opioid overdose outreach by public health and public safety agencies: Exploration of emerging programs in Massachusetts (Formica et al., 2018) • Plymouth County Outreach (Plymouth County District Attorney's Office, 2019) • Massachusetts Access to Recovery (Massachusetts Access to Recovery, 2020) <u>Peer Navigation</u>

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Table 3 (*continued*)

Strategies	Sample Resources
	• Ohio Mental Health & Addiction Services: Peer Recovery Support 101 (Ohio Department of Mental Health and Addiction Services, 2020) • Recovery Coach Academy (Friends of Recovery, 2020) • Providers Clinical Support System (Providers Clinical Support System, 2016a) and Addiction Technology Transfer Center Motivational Interviewing Training (Addiction Technology Transfer Center Network, 2019) • AnchorED (peer support in EDs following overdose) (The Providence Center, 2019) • Voices of Hope (Voices of Hope, 2019) • Boston Medical Center Recovery Coach Live (Boston Medical Center, 2019a) Referral Only • SAMHSA/HRSA Three Strategies for Effective Referrals to Specialty Mental Health and Addiction Services (SAMHSA-HRSA Center for Integrated Health Solutions, 2015) • New York Office of Addiction Services and Supports Guidance on Referral to a Pain or Addiction Specialist (New York Office of Addiction Services and Supports, 2012) • A Scoping Review of Post Opioid Overdose Interventions in Preventative Medicine (Bagley et al., 2019)
Starting individuals on MOUD as an adjunct to linkage programs (all relevant settings) (Busch et al., 2017; Cushman et al., 2016; D'Onofrio et al., 2015; Gordon et al., 2017; Weinstein et al., 2018; Zaller et al., 2013)	Within (or initiated within) Service Settings • SAMHSA TIP 63: Medications for OUD (Substance Abuse and Mental Health Services Administration, 2020d) • California Bridge (California Department of Health Care Services, 2018) and Project "Support for Hospital Opioid Use Treatment" (Project SHOUT and California Health Care Foundation, 2018) • National Commission on Correctional Healthcare Jail-based Medication Assisted Treatment (National Commission on Correctional Healthcare, 2018) • SAMHSA: Use of Medication Assisted Treatment for Opioid Use Disorder in Criminal Justice Settings (Substance Abuse and Mental Health Services Administration, 2019e) • "Principles of Drug Abuse Treatment of Criminal Justice Populations: A Research-Based Guide"(National Institute on Drug Abuse, 2014a) • SAMHSA: Clinical use of extended-release injectable naltrexone in the treatment of Opioid Use Disorder: A Brief Guide (Substance Abuse and Mental Health Services Administration, 2015a) • Opioid Response Network (American Academy of Addiction Psychiatry and State Targeted Response Technical Assistance Consortium, 2018) • Yale School of Emergency Medicine: Emergency Department-Initiated Buprenorphine (Yale School of Medicine, 2019) • American College of Emergency Physicians Emergency Quality Network Opioid Toolkit (American College of Emergency Physicians, 2020a) • SAMHSA National Helpline (Substance Abuse and Mental Health Services Administration, 2020e) • Harm Reduction agencies as potential site for buprenorphine treatment (Fox et al., 2015) • Addiction consultation services – Linking Hospitalized patients to outpatient addiction treatment (Trowbridge et al., 2017) • A Transitional Opioid program to Engage Hospitalized Drug Users (Shanahan et al., 2010) • MOUD Bridge Programs (Snow et al., 2019) • San Francisco Street Medicine Team (Carter et al., 2019)
Enhancement of clinical delivery approaches that support engagement and retention (Plater-Zyberk et al., 2012; Substance Abuse and Mental Health Services Administration, 2020)	c) **MOUD Treatment Engagement and Retention (required)** • A Systematic Review: Use of Psychosocial Interventions in Conjunction With Medications for the Treatment of Opioid Addiction (Providers Clinical Support System, 2016b) • Developing a Behavioral Treatment Protocol in Conjunction with Medication Assisted Treatment (Revised) (Providers Clinical Support System, 2018a) • Contingency Management (Carroll and Weiss, 2017) with Community Reinforcement Approach; Promoting Awareness of Motivational Incentives (Center for the Application of Substance Abuse Technologies, 2019) • Addiction Technology Transfer Center Network Motivational Interviewing Training (Addiction Technology Transfer Center Network, 2019)
Use of virtual retention approaches (e.g., mobile, web, digital therapeutics) (Pear Therapeutics, 2020; Substance Abuse and Mental Health Services Administration, date unknown)	• Boston Medical Center Recovery Coach Live (Boston Medical Center, 2019a) • reSET® Prescription Digital Therapeutic Software (Pear Therapeutics, 2020) • Computer-Based Training for Cognitive Behavioral Therapy (Carroll, 2008; Carroll et al., 2014; Shi et al., 2019) • Connections smartphone app (CHESS Health, 2020) • Center for Technology and Behavioral Health: Program Reviews (Center for Technology and Behavioral Health, 2020)
Utilize retention care coordinators	• SAMHSA: Wraparound Implementation and Practice Quality Standards (Substance Abuse and Mental Health Services Administration and Wraparound Evaluation and Research Team, 2016) • Centers for Disease Control: HIV Care Coordination Program (Centers for Disease Control and Prevention, 2018b) • Patient-centered Primary Institute Care Coordination Tip Sheet (Patient-Centered Primary Care Institute, 2016) • Patient-centered Primary Institute Referral and Care Coordination (Patient-Centered Primary Care Institute, 2015) • Boston Medical Center Office Based Addiction Treatment Continuum of Care ECHO (Boston Medical Center, 2019b) • Boston Medical Center Nurse Care Manager Office Based Addiction Treatment (Boston Medical Center, 2019a) • Preventing Addiction Related Suicide (Voss et al., 2013)

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Strategies	Sample Resources
Mental health and polysubstance use treatment integrated into MOUD care (Krawczyk et al., 2017; Sullivan et al., 2010)	• SAMHSA: General Principles for the Use of Pharmacological Agents To Treat Individuals With Co-Occurring Mental and Substance Use Disorders (Substance Abuse and Mental Health Services Administration, 2012a) • SAMHSA: TIP 42: Substance Abuse Treatment for Persons With Co-Occurring Disorders (Substance Abuse and Mental Health Services Administration, 2020f) • SAMHSA: Pharmacologic Guidelines for Treating Individuals with Post-Traumatic Stress Disorder and Co-Occurring Opioid Use Disorders (Substance Abuse and Mental Health Services Administration, 2012b) • American Psychiatric Association Learning Center: Treating Co-Occurring Depression and Opioid Use Disorder: A Case Discussion (American Psycihatric Association, 2015) • Integrated Group Therapy bipolar and substance use disorders (Weiss and Connery, 2011) • Unified Protocol for the Transdiagnostic Treatment of Emotional Disorders (Barlow et al., 2018) • Contingency Management (Carroll and Weiss, 2017) combined with Community Reinforcement Approach; Promoting Awareness of Motivational Incentives (Center for the Application of Substance Abuse Technologies, 2019) • Addiction Technology Transfer Center Network Motivational Interviewing Training (Addiction Technology Transfer Center Network, 2019) • Providers Clinical Support System Webinars (Providers Clinical Support System, 2019a) • National Institute on Drug Abuse Health Principles of Drug Addiction Treatment: A Research-Based Guide (National Institute on Drug Abuse, 2018) • SAMHSA In Brief: Substance Use and Suicide: A Nexus Requiring A Public Health Approach (Substance Abuse and Mental Health Services Administration, 2015c) • SAMHSA: TIP 50: Addressing Suicidal Thoughts and Behaviors in Substance Abuse Treatment (Substance Abuse and Mental Health Services Administration and Center for Substance Abuse Treatment, 2009) • National Institute of Mental Health Suicide Prevention Website (National Institute of Mental Health, 2019) • Suicide Prevention Resource Center (Suicide Prevention Resource Center, 2019)
Reducing barriers to housing, transportation, childcare and accessing other community benefits for people with opioid use disorder	• SAMHSA Homelessness Programs and Resources (Substance Abuse and Mental Health Services Administration, 2019d) • Ryan White HIV/AIDS Medical Case Management (Lopez et al., 2018) • Massachusetts Access to Recovery (Massachusetts Access to Recovery, 2020; The Massachusetts Substance Use Helpline, 2019) • Ohio recovery housing (Ohio Recovery Housing, 2019) • Kentucky: Voices of Hope (Voices of Hope, 2019) • Kentucky: Chrysalis House (residential SUD treatment and supportive housing) (Chrysalis House Inc., 2019) • Kentucky: Acquired Immunodeficiency Syndrome Volunteers KY (supportive housing, recovery support services) (AVOL KY Inc., 2019)

Footnotes. MOUD = Medication for opioid use disorder; SAMHSA = Substance Abuse and Mental Health Services Administration; ECHO = Extension for community healthcare outcomes; HRSA = The Health Resources and Services Administration.

pain (Bohnert et al., 2011; Dunn et al., 2010; James et al., 2019). As one of the HCS requirements, communities will record the high-risk populations and community venues included in the selected EBP strategies.

2.3. Development of ORCCA menu and EBP strategies

Subgroups were established for each of the three EBPs to assemble strategies and resources contained in the ORCCA. These subgroups created a forum for networking and collaboration among investigators with specific content expertise. Subgroups drafted each respective menu (OEND, MOUD, and safer opioid prescribing) and their Technical Assistance Guide subsections. Based on the likelihood of overdose reduction, the subgroups made recommendations on which strategies should be required and which should be optional. For example, the OEND subgroup recommended that "active" distribution of OEND be required, because it was concluded that reducing overdose on a community level required OEND being pro-actively provided to high-risk populations. It would not be enough to "passively" make it available regardless of overdose risk. Each subgroup reviewed the literature and completed online searches (e.g., SAMHSA website) for resources and toolkits. Upon completion of each subgroup's section, the full workgroup convened to vote and approve the ORCCA.

2.4. The ORCCA menus

2.4.1. Overdose education and naloxone distribution (OEND)

Naloxone reverses an opioid overdose if administered quickly. Overdose prevention education and broad community access to naloxone is associated with reduced opioid-involved overdose death (Bird et al., 2016; Clark et al., 2014; Giglio et al., 2015; McDonald and Strang, 2016; Walley et al., 2013b). OEND includes clear, direct messages about how to prevent opioid overdose and rescue a person who is overdosing to empower trainees to respond to overdoses. OEND can be successfully implemented at multiple venues among diverse populations. The OEND menu (see Table 2) includes three sub-menus: a) active OEND, which is required; b) passive OEND, which is optional; and c) naloxone administration, which is optional. The following sections describe the rationale and evidence for the OEND submenus.

a) Active OEND

Active OEND is proactive and targeted towards high-risk populations and their social networks or venues where high risk populations are likely to be found. Active OEND is a required ORCCA menu element because the best evidence for reducing overdose via OEND has been shown among communities that pro-actively make OEND accessible to those at high risk for overdose (Walley et al., 2013b) including people released from incarceration (Bird et al., 2016), and people with chronic pain treated with chronic opioid therapy through community health centers (Coffin et al., 2016). Opioid overdose education typically includes education about overdose risk factors and how to recognize and respond to an overdose, including naloxone administration; training can be provided in a variety of formats including in-person or on-line. Active OEND examples include: syringe service program workers providing

Table 4
Strategies to Improve Prescription Opioid Safety.

Strategies	Sample Resources
Safer opioid prescribing for acute pain across varied healthcare settings (Baker et al., 2016; Barth et al., 2017; Chang et al., 2017; Guy et al., 2017; Moore et al., 2018; Wunsch et al., 2016) • **Inpatient service** • **Emergency/urgent care** • **Outpatient clinics** • **Ambulatory surgery** • **Dental clinics**	a) **Safer opioid prescribing/dispensing practices (at least one required)** Pain management guidelines o Applying the CDC Guidelines for Prescribing Opioids (Centers for Disease Control and Prevention, 2017) o Advisories Against Misapplication of Opioid Prescribing Guidelines (Centers for Disease Control and Prevention, 2019a; Food and Drug Administration, 2019) o Acute Pain Management: Meeting the Challenges (VA PBM Academic Detailing Service, 2017b) o Management of Postoperative Pain: A Clinical Practice Guideline from the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine, and the American Society of Anesthesiologists' Committee on Regional Anesthesia, Executive Committee, and Administrative Council (Chou et al., 2016a) o Guideline for Discharge Opioid Prescriptions after Inpatient General Surgical Procedures (Hill et al., 2018) o Prescribing Opioids for Postoperative Pain – Supplemental Guidance (Dr. Robert Bree Collaborative and Washington State Agency Medical Directors' Group, 2018) o Dental Guideline on Prescribing Opioids for Acute Pain Management (Dr. Robert Bree Collaborative and Washington State Agency Medical Directors' Group, 2017) o The Treatment of Acute Pain in the Emergency Department: A White Paper Position Statement Prepared for the American Academy of Emergency Medicine (Motov et al., 2018) o Limiting Opioid Over Prescription: Payer-Provider Collaboration (Shah et al., 2020) Prescriber and pharmacist education o Safer/Competent Opioid Prescribing Education (SCOPE of Pain) (Boston University School of Medicine, 2019) o Providers Clinical Support System: Improving Opioid Prescribing: The CDC Guideline for Prescribing Opioids for Chronic Pain and Considerations for Dentistry (Providers Clinical Support System, 2018b) • Academic detailing and consult services o National Resource Center for Academic Detailing for the Opioid Crisis (National Resource Center for Academic Detailing, 2019) o Academic Detailing Service - Pain & Opioid Safety Initiative Materials (VA PBM Academic Detailing Service, 2017a) o Providers Clinical Support System Mentoring Program (Providers Clinical Support System, 2020c) o Massachusetts Consultation Service for the Treatment of Addiction and Pain (Powell et al., 2019) Patient education resources o Oregon Pain Guidance: Pain Education Toolkit (Oregon Pain Guidance Group, 2019b) o CDC Information for Patients (Centers for Disease Control and Prevention, 2019b)
Safer opioid prescribing for chronic pain (Barth et al., 2017; Bohnert et al., 2018, 2011; Dunn et al., 2010; Edlund et al., 2014; Gaiennie and Dols, 2018; Gomes et al., 2011; Guy et al., 2017; Jeffery et al., 2019; Liebschutz et al., 2017) • Adherence to CDC guidelines • Patient-centered opioid tapering	Pain management guidelines and toolkits o CDC: Guidelines for Prescribing Opioids for Chronic Pain (Centers for Disease Control and Prevention, 2019a; Dowell et al., 2016) o Oregon Pain Guidance (Oregon Pain Guidance Group, 2019b) Prescriber education o CDC online training series (Centers for Disease Control and Prevention, 2017) o Safer/Competent Opioid Prescribing Education (SCOPE of Pain) (Boston University School of Medicine, 2019) o Providers Clinical Support System – Chronic Pain Core Curriculum (Providers Clinical Support System, 2017a) Tapering guidelines and resources o CDC Pocket Guide: Tapering Opioids for Chronic Pain (Centers for Disease Control and Prevention, 2020a) o Oregon Pain Guidance: Tapering – Guidance & Tools (Oregon Pain Guidance Group, 2020) o Opioid Taper Decision Tool (VA PBM Academic Detailing Service, 2016) o Opioid Tapering Template (RxFiles Academic Detailing, 2018) o U.S. Department of Health and Human Services Guide on Opioid Tapering (Working Group on Patient-Centered Reduction or Discontinuation of Long-term Opioid Analgesics, 2019) • Academic detailing and consult services o National Resource Center for Academic Detailing for the Opioid Crisis (National Resource Center for Academic Detailing, 2019) o Academic Detailing Service - Pain & Opioid Safety Initiative Materials (VA PBM Academic Detailing Service, 2017a) o Massachusetts Consultation Service for the Treatment of Addiction and Pain (Powell et al., 2019) • Patient education resources o Oregon Pain Guidance: Pain Education Toolkit (Oregon Pain Guidance Group, 2019a) o CDC Information for Patients (Centers for Disease Control and Prevention, 2019b) o Naloxone co-prescribing: Prescribe To Prevent (, Lim et al., 2016) • Prescription drug monitoring programs o Kentucky: Kentucky All Schedule Prescription Electronic Reporting (Kentucky Cabinet for Health and Family Services, 2017)

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Table 4 (*continued*)

Strategies	Sample Resources
Safer opioid dispensing (Hartung et al., 2017; Shafer et al., 2017; Wu et al., 2017)	o Massachusetts: Massachusetts Prescription Awareness Too (Commonwealth of Massachusetts, 2020) o New York: Internet System for Tracking Over-Prescribing (New York State Department of Health, 2019b) o Ohio: Ohio Automated Rx Reporting System (State of Ohio Board of Pharmacy, 2020b) • Pharmacist education o Collaborate for Responsible Opioid Use (American Pharmacists Association, 2020) o Balancing Risk and Access to Opioids: The Role of the Pharmacist (American Pharmacists Association, 2017) • Academic detailing and consult services o National Resource Center for Academic Detailing for the Opioid Crisis (National Resource Center for Academic Detailing, 2019) o Academic Detailing Service - Pain & Opioid Safety Initiative Materials (VA PBM Academic Detailing Service, 2017a) • Naloxone dispensing: Prescribe To Prevent (, Lim et al., 2016) Prescription drug monitoring programs (listed above)
Prescription drug drop-box / mail-back programs (Egan et al., 2018; Gray et al., 2015; Kennedy-Hendricks et al., 2016)	b) **Safer opioid disposal practices (optional)** • Identification of current drug disposal locations o Prescription Drop box locator (National Association of Drug Diversion Investigators, 2020) o AWARxE Prescription Drug Safety (National Association of Boards of Pharmacy, 2020) • Implementation of prescription drug disposal program o Drug Enforcement Agency National Prescription Drug Take Back Day (U.S. Drug Enforcement Administration, 2020) o Safe Drug Disposal: A Guide for Communities Seeking Solutions (Partnership for Drug-Free Kids, 2018) o How-to Guide for Drug Take-Back: Managing a Pharmacy-based Collection Program for Leftover Household Pharmaceuticals (Product Stewardship Institute and New York Product Stewardship Council, 2016) o Drug Enforcement Agency Registrant Site for Drug Disposal (U.S. Department of Justice Drug Enforcement Administration, 2020) o New York State Drug Take Back Act (New York State Department of Health, 2019a) o Massachusetts Department of Environmental Protection: Safely Dispose of Prescription Drugs (Massachusetts Department of Environmental Protection, 2020)

Footnotes. *CDC* = Centers for Disease Control and Prevention; SAMHSA = Substance Abuse and Mental Health Services Administration.

OEND to people who inject opioids (Doe-Simkins et al., 2014; Walley et al., 2013b; Wheeler et al., 2015); emergency department staff providing OEND to patients seen for opioid-use complications (Dwyer et al., 2015; Gunn et al., 2018); and equipping people released from incarceration with naloxone (Bird et al., 2016; Wenger et al., 2019).

b) Passive OEND

Passive OEND increases OEND access to individuals referred by other providers and those seeking OEND on their own and makes naloxone available for immediate use in overdose hotspots. As an optional ORCCA submenu, passive OEND strategies are encouraged but not required because their impact is unlikely to be adequate to reduce overdose deaths compared to active OEND strategies. Examples of passive OEND include distributing naloxone at a community meeting or making naloxone available at a pharmacy without a prescription (Jones et al., 2019; Pollini et al., 2020; Sohn et al., 2019), for example through pharmacy standing orders (Abouk et al., 2019; Davis and Carr, 2017; Evoy et al., 2018; Xu et al., 2018). This submenu also includes publicly available naloxone for emergency use where overdoses commonly occur, such as public restrooms (Capraro and Rebola, 2018).

c) Naloxone administration

The naloxone administration submenu focuses on increasing capacity for opioid overdose response and rescue by first responders such as police (Wagner et al., 2016) and fire and emergency medical technicians (Davis et al., 2015, 2014a; Davis et al., 2014b; Rando et al., 2015). In these programs, first responders are trained in overdose response and equipped with naloxone, so they have the capacity to administer naloxone when called. They do not distribute naloxone to others in the community. This is also an optional menu item because the impact is unlikely to be adequate to reduce overdose deaths compared to active OEND.

2.4.2. Effective delivery of MOUD, including agonist / partial agonist medication

MOUD decreases the risk of opioid-involved death (Larochelle et al., 2018; Pearce et al., 2020; Sordo et al., 2017) but is widely underutilized (Volkow and Wargo, 2018; Williams et al., 2018). Barriers to improved MOUD utilization include inadequate treatment availability, failure to identify and engage high-risk populations in MOUD, and poor treatment retention (Morgan et al., 2018; Samples et al., 2018). Accordingly, the MOUD menu (Table 3) is composed of three sub-menus: a) expand MOUD treatment availability; b) interventions to link people in need to MOUD; and c) MOUD engagement and retention. It is required that communities choose at least one strategy from each of the three MOUD submenus. Evidence for decreasing mortality is strongest for methadone and buprenorphine. Therefore, communities are required to choose strategies that expand access to, and improve retention in, treatment with these medications. Strategies that focus on naltrexone are optional since this medication has less evidence for reducing opioid-involved overdose (Larochelle et al., 2018), although clinical trials suggest extended-release injection naltrexone can be effective for relapse prevention if adherence is secured (Lee et al., 2016, 2018; Tanum et al., 2017). The following sections describe the rationale and evidence for the three required submenus within the MOUD menu.

a) Expand MOUD treatment availability (capacity building)

Communities must select at least one strategy that expands MOUD treatment availability with buprenorphine or methadone from this

submenu. Though each potential strategy includes multiple venues, the ORCCA does not prescribe which venues must be included outside of the overall requirement that communities choose at least one strategy that addresses healthcare, behavioral health, and criminal justice settings across all three main menus. The first submenu strategy is adding and/or expanding MOUD treatment in primary care, other general medical and mental health settings and substance use disorder treatment and recovery programs. Historically in the US, addiction treatment has been isolated from general medical and mental health care settings, and MOUD treatment has been omitted from the care provided in primary care, hospitals (Fanucchi and Lofwall, 2016; Jicha et al., 2019), emergency departments (Hawk et al., 2020), and general mental health (Novak et al., 2019). Furthermore, according to data from the National Survey of Substance Abuse Treatment Facilities, many substance use disorder treatment programs do not provide MOUD (Substance Abuse and Mental Health Services Administration, 2019c). Specifically, in 2018, the proportion of facilities offering buprenorphine, methadone, and long-acting naltrexone treatment was 33 %, 10 %, and 28 % respectively (Substance Abuse and Mental Health Services Administration, 2019c). MOUD treatment can be successfully integrated in these settings, increasing capacity and reducing treatment barriers (Blanco and Volkow, 2019; Chou et al., 2016b; Korthuis et al., 2017).

The second submenu strategy is adding and/or expanding MOUD treatment in criminal justice settings. Despite the strong evidence base, MOUD is not commonly provided in criminal justice settings, with only 30 out of 5100 US prisons and jails offering methadone or buprenorphine in 2017 (Substance Abuse and Mental Health Services Administration, 2019e). Incarceration is associated with increased risk of overdose death post-release largely due to loss of tolerance after forced withdrawal during incarceration (Binswanger et al., 2013; Merrall et al., 2010). Improving availability of MOUD in criminal justice settings, including pre-trial, jail, prison, probation, and parole, is a critical opportunity to reduce opioid-involved overdose deaths (Moore et al., 2019).

The third submenu strategy is expanding access to MOUD treatment through telemedicine, interim buprenorphine (Sigmon et al., 2016), interim methadone (Newman, 2014; Schwartz et al., 2006), or medication units (Office of the Federal Register and Government Publishing Office, 2019b). Expanding access to MOUD through telemedicine is especially salient as communities consider ORCCA strategies during the COVID-19 pandemic. Telemedicine models for buprenorphine treatment already existed (U.S. Department of Health and Human Services, 2018), but guidance from the US Drug Enforcement Agency, SAMHSA, the Centers for Medicare & Medicaid Services, and state regulatory agencies changed rapidly (Harris et al., 2020; Opioid Response Network, 2020; Providers Clinical Support System, 2020a; Substance Abuse and Mental Health Services Administration, 2020c) to allow greater flexibility of MOUD treatment via telemedicine during the pandemic. For example, the requirement for an in-person visit to begin MOUD was waived and dispensing of medications was allowed for longer periods of time. It is unclear how effective these changes will be or whether they will remain, but telemedicine is part of the OUD treatment landscape and an important tool to support treatment access. "Interim" treatment with methadone or buprenorphine refers to treatment with medication dispensed directly to patients (no prescription given) at licensed opioid treatment programs, which are heavily regulated at a federal and state level and require comprehensive ancillary services (e.g., on-site counseling). When there are waiting lists, these programs may receive regulatory approval to provide medication for up to 180 days while patients await the full array of non-medication services. This is called "interim" treatment and is superior to waiting lists on multiple outcomes including illicit opioid use and treatment retention (Sigmon, 2015). A medication unit is a satellite to a licensed opioid treatment program providing primarily medication dispensing in order to make treatment more accessible to patients (Office of the Federal Register and Government Publishing Office, 2019b). New patients are required to have direct supervision of their daily dispensed medication for the first 90 days of treatment, making travel a barrier to treatment if the program is located far away from the patient. Therefore, medication units are a way to extend the availability of methadone treatment over a wider geographic region.

b) Interventions to link to MOUD

The second submenu focuses on strategies that link people with OUD to MOUD. There are two strategies to choose from: improving linkage to MOUD from venues where persons with OUD may be encountered (e.g., general medical and mental health treatment programs, syringe service programs, and criminal justice settings); and using MOUD initiation as a bridge to longer-term care (starting MOUD at the venue where the patient is encountered in addition to linkage to ongoing MOUD treatment). On-site MOUD initiation strategies are preferred and can occur across multiple community-based settings such as in emergency departments and hospitals where patients may present with complications of untreated OUD such as an opioid overdose or a deep-seated infection related to intravenous injection of opioids. Starting MOUD in these venues is safe, feasible, and can significantly increase likelihood of continuing MOUD treatment (D'Onofrio et al., 2015; Weinstein et al., 2018).

c) MOUD treatment engagement and retention

MOUD treatment retention beyond 6 months is challenging (Samples et al., 2018), but critical to saving lives. Research is clear that MOUD treatment retention is strongly associated with decreased mortality – both from overdose and all-cause mortality, with risk of overdose increasing dramatically after discontinuation of MOUD (Pearce et al., 2020; Wakeman et al., 2020; Walley et al., 2020; Williams et al., 2020). Communities must choose at least one of the following five strategies: a) enhancement of clinical delivery approaches to support engagement and retention; b) use of virtual retention approaches; c) retention care coordinators; d) mental health and polysubstance use treatment integrated into MOUD care; and e) reducing barriers to housing, transportation, childcare, and accessing other community benefits for people with OUD. Comprehensive strategies to improve MOUD treatment retention include addressing each individual's treatment needs, which commonly include treatment for comorbid mental health and non-opioid substance use disorders as well as reducing barriers to resources such as housing, transportation, insurance coverage, food security, childcare, employment and other psychosocial and community services (Substance Abuse and Mental Health Services Administration, 2020d). Shared decision making, case management, legal assistance and advocacy, on-site psychiatric services and psychosocial recovery support, insurance navigation, behavioral interventions such as contingency management for comorbid non-opioid substance use disorders (De Crescenzo et al., 2018), and technology-delivered therapies (Christensen et al., 2014) are some example strategies aimed at improving engagement and retention.

2.4.3. Prescription opioid safety

Opioid analgesic prescribing practices can increase the risk of long-term opioid use, the development of OUD and opioid-involved overdose deaths. For example, an opioid analgesic prescription is associated with increased risk for OUD in persons with chronic non-cancer pain (Edlund et al., 2014) and the length of an initial opioid prescription for acute pain is a significant predictor of long-term use (Shah et al., 2017). Similarly, high doses of opioids (e.g., >90 morphine milligram equivalents) (Bohnert et al., 2016; Dasgupta et al., 2016), use of extended-release/long-acting opioids (Zedler et al., 2014) and concurrent prescribing of benzodiazepines increase the risk of overdose (Hernandez et al., 2018; Sun et al., 2017). Those with co-occurring mood disorders, other non-opioid substance use disorders, chronic medical conditions, and chronic pain are at heightened risk (Campbell et al.,

2018). When prescribed opioids are not properly stored or go unused, the excess supply is a potential source for non-medical use and/or diversion; the majority of persons reporting non-medical use of prescription opioids obtain them from a friend or family member (Substance Abuse and Mental Health Services Administration, 2019a). Numerous safer opioid prescribing guidelines have been published (Chou et al., 2009; Franklin and American Academy of, 2014; Manchikanti et al., 2012; Nuckols et al., 2014), however, adherence to these guidelines is low (Hildebran et al., 2014; Sekhon et al., 2013; Starrels et al., 2011). Pain management education remains inadequate (Mezei et al., 2011), but is a key strategy to address poor adherence to guideline-based safer opioid prescribing practices. Accordingly, the prescription opioid safety menu (Table 4) includes two submenus: a) safer opioid prescribing/ dispensing practices, which is required, and b) safer opioid disposal practices, which is optional.

a) Safer opioid prescribing/dispensing practices

Communities must select at least one of the following three strategies: 1) safer opioid prescribing for acute pain across healthcare settings, such as inpatient services, emergency departments, outpatient clinics, ambulatory surgery and dental clinics; 2) safer opioid prescribing for chronic pain, including adherence to the CDC guideline recommendations and patient-centered opioid tapering; or 3) safer opioid dispensing. A variety of approaches have been effective in promoting safer opioid prescribing. For example, opioid prescribing changes were observed following implementation of the CDC 2016 chronic pain guidelines (Bohnert et al., 2018). Online and in-person continuing education has been shown to improve knowledge, attitudes, confidence and self-reported clinical practice in safer opioid prescribing (Alford et al., 2016). Academic detailing, an interactive one-on-one educational outreach by a healthcare provider to a prescriber to provide unbiased, evidence-based information to improve patient care, has been applied successfully to improve opioid prescribing behavior (Larson et al., 2018; Voelker and Schauberger, 2018). The utilization of state Prescription Drug Monitoring Programs to assess patients' controlled substance prescription histories and identify potential risky patterns of opioid use or drug combinations has resulted in reduced multiple-provider episodes (i.e., "doctor shopping") (Strickler et al., 2020), reduced high-risk opioid prescribing (Strickler et al., 2019), and reduced prescription opioid poisonings (Pauly et al., 2018). Prescriber feedback regarding a patient's fatal overdose can also change prescriber behavior (Doctor et al., 2018; Volkow and Baler, 2018). Most efforts to promote safer opioid analgesic use have focused on prescriber behavior change. However, pharmacists are the last line of defense against unsafe opioid prescriptions and have a corresponding responsibility to ensure legitimate prescriptions (Office of the Federal Register and Government Publishing Office, 2011).

b) Safer opioid disposal practices (optional)

Providing safe, convenient, and environmentally appropriate ways to dispose of unused prescription opioids can help reduce the excess opioid supply within communities and prevent access by children, adolescents, and other vulnerable individuals. Communities have the option of selecting a strategy to promote safe disposal practices such as the installation of permanent disposal kiosks or the implementation of other disposal programs such as distribution of drug mail-back envelopes. Studies have shown that leftover medication from an opioid prescription is common (Bicket et al., 2017; Kennedy-Hendricks et al., 2016) and that patient education regarding disposal practices can increase opioid disposal rates (Hasak et al., 2018), although education about disposal is suboptimal (Gregorian et al., 2020). According to a recent study, only 30 % of persons who had received an opioid prescription in the previous two years disposed of their unused opioid medication; however, over 80 % indicated they would be more likely to dispose of opioid medications in the future if disposal kiosks were in a location they visited frequently (Buffington et al., 2019).

2.5. Emerging ORCCA strategies

Because the evidence base will evolve during the course of this study, additional strategies can be added to the menus if any of the following inclusion criteria are met: 1) listed in a registry of EBPs (federal, state, or community) that documents it has been replicated multiple times with positive effects; 2) evidence of its efficacy through, at a minimum, a quasi-experimental design; 3) evidence of its efficacy in reducing opioid-involved overdose death that has been published in a scientific journal; or 4) it has been reviewed and approved by the ORCCA Steering Committee.

2.6. ORCCA technical assistance guide

Upon completion of the ORCCA menus, the subgroups developed a companion Technical Assistance Guide which provides greater detail about the resources included in the ORCCA menus (i.e., the resources listed in the "Sample Resources" column of Tables 1–4). The resources compiled in the Guide (e.g., toolkits, publications, websites) are designed to help implement and sustain each EBP and strategy included on an ORCCA menu and provides examples of successful national, state, and local programs. The Guide is considered a "living document" and is updated every six months by a dedicated subgroup spanning the research sites.

3. Discussion

The HCS seeks to facilitate widespread uptake and expansion of three EBPs with the potential to reduce opioid-involved overdose fatalities: 1) OEND; 2) effective delivery of MOUD, including agonist / partial agonist medication; and 3) prescription opioid safety. This paper described the development of the ORCCA, which includes a menu-based approach to organizing strategies and resources for facilitating implementation of these EBPs. The ORCCA includes requirements and recommendations for EBP implementation to help ensure standardization across the research sites. At minimum, five strategies need to be selected to implement the three EBPs: one for OEND, three for MOUD, and one for prescription opioid safety. Based on a literature review and expert consensus, the ORCCA requires identification, and engagement of, high-risk populations in healthcare, behavioral health, and criminal justice settings, which will help ensure both that individuals most in need of services receive them and that implementation of EBPs will be more widespread in communities than could be achieved by allowing implementation within a narrower range of settings.

Importantly, the ORCCA does not prescribe the implementation of any single strategy; rather, it provides flexibility with multiple strategy options for implementing the required EBPs, all of which were chosen based on the scientific evidence. Because each community will vary in the need, feasibility, readiness, desirability, stage of current implementation, and expected impact for specific practices, they will likely differ in their strategies and venues for implementing the three required EBPs. Many of the resources included in the ORCCA menus and Technical Assistance Guide have been developed to directly assist community coalitions, implementation teams, administrators, and practitioners who seek to implement or expand EBPs. In the HCS, the implementation of selected strategies will be a partnership between the community coalitions and the research site team, with the research site providing technical support. A limitation of the approach taken to ORCCA development is that a formal systematic review of the literature, such as that outlined by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Moher et al., 2009), was not completed and, thus, potential strategies that could effectively support EBP implementation may have been missed. A strength of the approach is that, in addition to meeting the needs of the HCS communities, the ORCCA was designed for

dissemination to other communities struggling with the opioid crisis should the HCS model prove effective. The flexibility included in the ORCCA, along with the resources included in the ORCCA menus and the Technical Assistance Guide, will increase the ease of implementation, with knowledgeable clinical experts in place of a research team, who partner with coalitions and organizations to select and implement practices that will achieve desired outcomes and foster sustainability.

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Contributors

Drs. Winhusen, Walley, Fanucchi, Hunt, Lofwall, Freeman, and Chandler contributed to the conceptualization, design, drafting of the manuscript, and critically reviewed and revised the manuscript. Drs. Lyons, Brown, Nunes, Saitz, Stambaugh, Alford; Ms. Beers, and Ms. Herron contributed to the conceptualization, design, and critically reviewed and revised the manuscript. Drs. Oga, Roberts, Starrels; Mr. Baker, and Mr. Cook contributed to the design, and critically reviewed and revised the manuscript. All authors contributed to and have approved the final manuscript.

Trial registration

Clinical Trials.gov http://www.clinicaltrials.gov; Identifier: NCT04111939.

Declaration of Competing Interest

RS reports Alkermes provided injectable naltrexone to Boston University for an NIH-funded study of which he is principal investigator. JS reports receiving research support from the Opioid Post-marketing Requirement Consortiumand having served as a core expert on the 2016 CDC Guideline committee. The other authors declare no conflicts of interest.

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