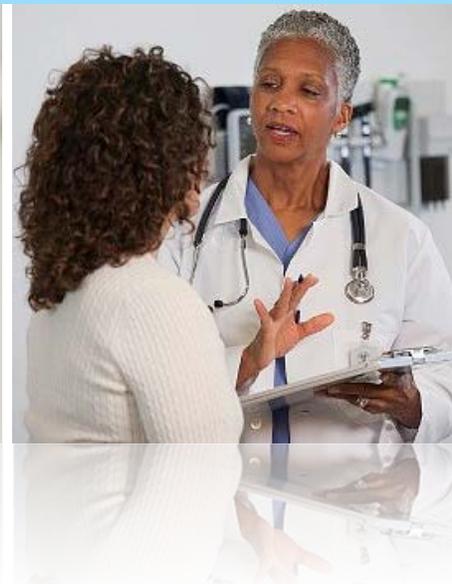


**Department of Health and Human Services**  
**Pain Management Task Force**  
Environmental Scan Report



**Environmental Scan Report**  
April 11, 2018

## EXECUTIVE SUMMARY

Pain management is a complex, multidisciplinary field consisting of a variety of syndromes present in both the acute and chronic phases. In recent years, a dramatic increase in deaths from opioid overdose and other harms related to prescribing opioids for pain management has led clinical experts and policy analysts to acknowledge the need to examine clinical practices in pain management. Factors related to provider and patient education, risk stratification, service delivery coverage, and increasing stigma have further complicated the use of opioids for the treatment of pain and imposed challenges upon clinical management of acute and chronic pain. The Comprehensive Addiction and Recovery Act (CARA) calls for a coordinated response, including the establishment of an interagency task force to: (1) identify best practices for chronic and acute pain management and the prescription of pain medication (2) identify gaps and inconsistencies in current practices and (3) identify ways to best disseminate this information.

This Environmental Scan (ES) Report informs the Pain Management Task Force (PMTF) established by CARA and provides a brief overview of many clinical best practices and guidelines (CBPs), including those developed by medical associations and federal, state, and local government organizations for management of acute and chronic pain. The ES Report reviews pain management treatment approaches and provides the PMTF with a basis by which to address questions specified in part by CARA legislation. An initial set of questions for PMTF to consider include:

1. What are existing clinical best practices for management of acute and chronic pain developed by medical professional associations and the federal, state, and local governments?
2. What are existing knowledge gaps and inconsistencies across identified clinical best practices?
3. How do existing clinical best practices inform guidance on specific topics specified by the CARA language, including:
  - a) Pharmacological, non-pharmacological, and medical device alternatives to opioids to reduce opioid monotherapy in appropriate cases
  - b) Optimizing treatments based on differences within and between classes of opioids
  - c) Opioids with abuse deterrent technology
  - d) Management of high-risk populations who receive opioids in the course of medical care, other than for pain management
4. How do non-clinical (i.e., policy-related) best practices advance and support best practices for management of acute and chronic pain?

The ES Report identifies 38 CBPs, which include clinical recommendations among biopsychosocial and multidisciplinary approaches to pain management, including medication; physical therapy; psychological approaches; surgical and minimally invasive procedures; and complementary and alternative medicine (Question 1). The ES Report describes CBPs relevant to pain management topics that can inform the existence of gaps or inconsistencies across best practices (Question 2), including four topics specified by CARA legislation. First, CBPs recommend multiple pharmacological and non-pharmacological alternatives (including medical devices, as well as complementary and alternative medicine approaches) to opioids (Question 3a). Second, CBPs do not make definitive recommendations about optimizing treatments based on differences within and between classes of opioids (Question 3b). Third, CBPs suggest that abuse-

#### Task 4: Environmental Scan Report

deterrent technologies can be partially effective in the prevention of opioid abuse or misuse and should be used as part of a multifaceted-approach (Question 3c). Fourth, CBPs provide recommendations for management of high-risk populations, including prioritization of non-opioid interventions, consideration of abuse deterrent technology, medication-assisted treatment, provision of naloxone, and prioritization of non-pharmacological treatments (Question 3d). Finally, policy best practices facilitate the execution of CBPs and support other areas of pain management, including risk assessment and mitigation; patient education; provider education; access to care; medication-assisted treatment; provision of naloxone; parity laws; fentanyl detection; and stigma (Question 4). Further analysis of best practices identified by the ES or by the PMTF during future working group discussion may reveal gaps and inconsistencies that could inform development of more effective best practices for providers and policy makers.

## TABLE OF CONTENTS

Executive Summary.....	i
<b>1 Introduction .....</b>	<b>1</b>
1.1 Objectives.....	1
<b>2 Methods .....</b>	<b>2</b>
2.1 Research .....	2
2.1.1 <i>Research Questions</i> .....	3
2.1.2 <i>Searches</i> .....	3
2.2 Analysis .....	4
<b>3 Results .....</b>	<b>4</b>
3.1 Description Identified Best Practices .....	4
3.2 Clinical Best Practices .....	6
3.2.1 <i>Approaches to Pain Management</i> .....	7
3.2.2 <i>Medication</i> .....	7
3.2.3 <i>Physical Therapy</i> .....	11
3.2.4 <i>Psychological Approaches</i> .....	12
3.2.5 <i>Surgical and Minimally Invasive Procedures</i> .....	14
3.2.6 <i>Complementary and Alternative Medicine</i> .....	15
3.2.7 <i>Other Considerations of Importance</i> .....	16
3.3 Policy Best Practices .....	18
3.3.1 <i>Risk Assessment and Mitigation</i> .....	18
3.3.2 <i>Patient Education</i> .....	19
3.3.3 <i>Provider Education</i> .....	19
3.3.4 <i>Access to Care</i> .....	20
3.3.5 <i>Medication-Assisted Treatment Access</i> .....	20
3.3.6 <i>Provision of Naloxone</i> .....	21
3.3.7 <i>Parity Laws</i> .....	21
3.3.8 <i>Illicit Fentanyl Detection</i> .....	22
3.3.9 <i>Stigma</i> .....	22
Acronyms .....	24
References .....	25
Appendix A: Research Literature Search .....	39
Appendix B: Stakeholder Organizations Search .....	40
Appendix C: Conferences Search .....	41
Appendix D: State and Local Search .....	42
Appendix E: Clinical Best Practices Analysis.....	43

## TABLES

Table 1: Clinical Best Practice (CBP) Analysis .....	5
Table 2: Search Terms .....	39
Table 3: Pain Management Stakeholder Organizations.....	40
Table 4: Pain Management Conference Websites.....	41
Table 5: Search Terms .....	42

## FIGURES

Figure 1: Overview of Pain Management Task Force Process.....	2
Figure 2: Environmental Scan Methods.....	2

## 1 INTRODUCTION

The International Association for the Study of Pain (IASP) defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (IASP, 2017). Pain is a universal experience with profound physical, emotional, and societal costs within our nation (Institute of Medicine, 2011; National Academies of Sciences, Engineering, and Medicine, 2017). The clinical management of pain is a complex, multidisciplinary challenge that has changed significantly in recent decades. In the 1990s, pain management experts began to recognize the issue of inadequate treatment of individuals with pain, leading in part to recognition of pain as a “fifth vital sign,” which many health care organizations adopted in an effort to improve assessment and treatment of pain (Mularski et al., 2006). Clinical guidelines recommending the use of opioids as medication-based treatment began to emerge (Haddox et al., 1997) and marketing of opioid formulations (National Academies, 2017) coincided with a shift in pain management practices towards increased prescription of opioids for pain. Between 2007 and 2012, opioid prescriptions per capita increased 7.3 percent with an estimated 259 million prescriptions written for opioid pain medication in 2012 (Paulozzi, Mack, Hockenberry, and Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control, CDC, 2014).

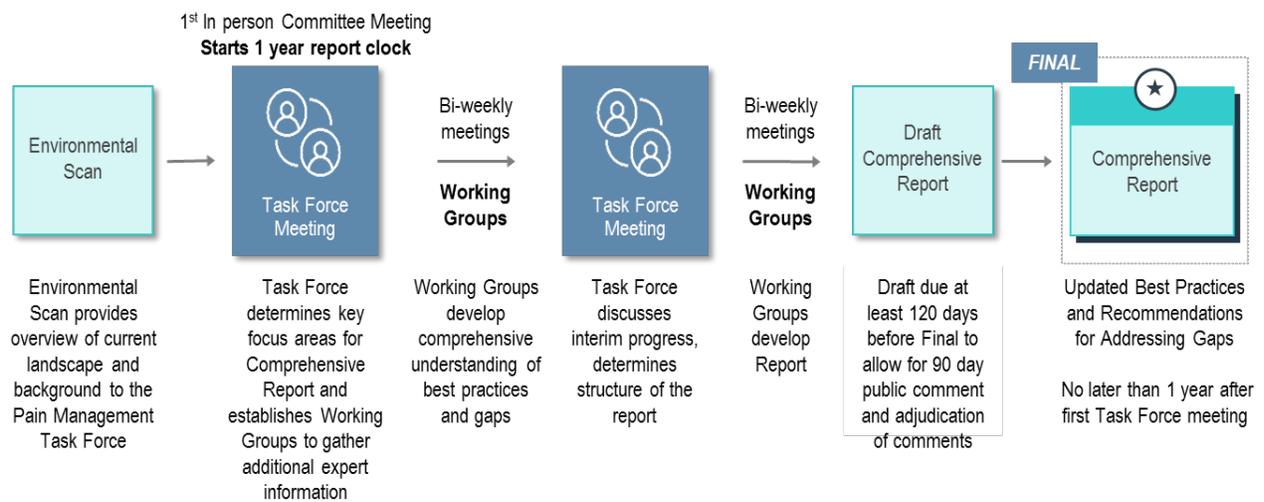
Contemporary pain management has been further challenged in recent years, as the US has experienced a dramatic increase in deaths from opioid overdose, substance use disorders, and other harms related to prescribing opioids for pain management (National Academies, 2017). The Centers for Disease Control and Prevention (CDC) estimated that the total number of deaths due to prescription opioids nearly doubled between 1999 and 2011 (NCHS, 2016). Additionally, the CDC estimated that opioids were involved in 61 percent of the 47,055 drug overdose deaths occurring in 2014 (Rudd, 2016). Several other factors have further complicated the use of opioids for the treatment of pain, including stigma associated with opioid use, mental health challenges, substance use disorders, a fragmented health care delivery system, and poor access to evidence-based treatment services (National Academies, 2017).

In 2016, the Comprehensive Addiction and Recovery Act (CARA) was signed into law; it seeks to “address the opioid epidemic, encompassing all six pillars necessary for such a coordinated response – prevention, treatment, recovery, law enforcement, criminal justice reform, and overdose reversal” (Comprehensive Addiction and Recovery Act, 2016). One provision of CARA is to establish “an interagency task force, led by the Department of Health and Human Services (HHS), in conjunction with the Department of Defense (DoD), the Department of Veterans Affairs (VA), and the White House Office of National Drug Control Policy (ONDCP). The Task Force is mandated to develop a set of best practices for chronic and acute pain management and prescribing pain medication.” The CARA legislation further instructs the task force to “determine whether there are gaps in or inconsistencies between best practices for pain management.” The CARA-mandated task force includes non-federal members that encompass a broad range of stakeholders.

### 1.1 Objectives

This Environmental Scan (ES) Report informs the Pain Management Task Force (PMTF) established by CARA in the identification of best practices for pain management. The ES Report provides a brief overview of clinical best practices (CBPs) published since 2012 that include recommendations developed by medical associations, as well as federal, state and local government organizations, for management of acute and chronic pain. The ES Report, by design, is not an exhaustive review. The ES Report can be used to establish a common understanding across topics and provides the PMTF with a basis by which to address specific research questions specified in part by CARA legislation.

Figure 1: Overview of Pain Management Task Force Process



## 2 METHODS

The methods of this ES Report (see Figure 2) include three phases designed to collect, identify, and describe CBPs and policy-related best practices across specific pain management topic areas (see Table 1). Phase I (Research) includes defining the research questions of the ES Report, as well as development and execution of searches to collect best practices. Phase II (Analysis) identifies which best practices addressed specific pain management topic areas, as determined by the research questions and discussion with HHS. Phase III (Description) includes development of this Draft ES Report.

Figure 2: Environmental Scan Methods



### 2.1 Research

The research processes supporting the ES Report are designed to identify and collect best practices informing pain management and opioid prescription. For the purposes of this ES Report, CBPs are defined as formal clinical practice guidelines (CPGs) or systematic reviews that include clinical recommendations. Specific steps of the research process include the development of research questions, defining search methods, conducting literature searches, and the collection and organization of identified documents.

### 2.1.1 Research Questions

Based on language from CARA and discussions with HHS PMTF officials, the ES Report is designed to aid the PMTF in addressing the following research questions:

1. What are existing clinical best practices for management of acute and chronic pain developed by the federal, state and local governments, and medical professional associations?
2. What are existing knowledge gaps and inconsistencies across identified clinical best practices?
3. How do existing clinical best practices inform guidance on specific topics specified by the Comprehensive Addiction and Recovery Act (CARA) language, including:
  - a) Pharmacological, non-pharmacological, and medical device alternatives to opioids to reduce opioid monotherapy in appropriate cases
  - b) Optimizing treatments based on differences within and between classes of opioids
  - c) Opioids with abuse deterrent technology
  - d) Management of high-risk populations who receive opioids in the course of medical care, other than for pain management
4. How do non-clinical (i.e., policy-related) best practices advance and support clinical best practices for management of acute and chronic pain?

### 2.1.2 Searches

The ES Report includes four search activities that identify and collect best practices relevant to the research questions and relevant pain management topic areas.

#### 2.1.2.1 Search A: Research Literature

The ES Report includes a search of research literature to identify CBPs published in scientific and medical journals since 2012 that inform the research questions and identified pain management topic areas. The research literature examination consists of a PubMed search using defined search terms (see [Appendix A](#)) to identify additional best practices and publications describing background, development, effectiveness and/or impact of best practices.

#### 2.1.2.2 Search B: Stakeholder Organizations

The ES Report includes a search for CBPs disseminated by pain management stakeholder organization using a Google search for websites of pain management stakeholder organizations to identify best practices developed, disseminated, or endorsed by these organizations since 2012 ([Appendix B](#)). In addition to federal stakeholder organizations, the search targeted non-federal organizations, including private-sector, non-profit, and medical associations ([Appendix B](#)).

#### 2.1.2.3 Search C: Conferences

The ES Report includes a Google search for pain management conference websites ([Appendix C](#)) to identify best practices or publications describing background, development, effectiveness, and/or impact of best practices disseminated from 2012 to present.

#### 2.1.2.4 Search D: State-by-State and Local

The ES Report includes a Google search of selected state and local websites ([Appendix D](#)) for clinical or policy best practices developed, disseminated, or published since 2012.

## 2.2 Analysis

The ES Report identifies CBPs addressing specific topics within multidisciplinary treatment areas, including medication, physical therapy, psychological approaches, surgical and minimally-invasive procedures, complementary and alternative medicine approaches, and other considerations. Each CBP was reviewed for language addressing or stating clinical recommendations about 17 topic areas (see Table 1). Text excerpts from CBPs are copied into or summarized in the CBP Analysis Table (see Appendix E) for review. Individual topic areas are reviewed across CBPs to identify high-level patterns, gaps, and/or inconsistencies. The ES Report also reviews identified policy best practice documents to summarize how policy recommendations and actions support existing clinical recommendations identified as CBPs.

## 3 RESULTS

Results of the ES Report begin with a description of identified best practices. The Clinical Best Practices section describes CBPs across pain management topic areas. Within the clinical section, subsections that describe each topic area are divided into three paragraphs that: 1) introduce the topic, 2) describe CBPs that address the topic, and 3) describe ongoing research or research needs associated with the topic. The Policy Best Practices section provides an overview of policy best practices that support CBPs and other aspects of pain management.

### 3.1 Description Identified Best Practices

The ES Report identifies 38 CBP documents that vary across focus area of recommendations, pain type, and population. Some CBP documents address pain management, while others focus specifically on opioid prescribing within pain management. Some CBP documents address adult populations, while some were focused on subpopulations including elderly adults, HIV-positive patients, or US military service members and veterans. Some CBPs also focus on specific subtypes of pain, including back pain, intraoperative and perioperative pain, neuropathic pain, and cancer pain. It's also noteworthy that some CBPs are based upon other CBPs identified by this search. Three CBPs (Oregon Health Authority, 2017; Tehama County Health Services Agency, 2017; West Virginia Board of Pharmacy, 2016) are adapted from a 2016 CBP developed by CDC (Dowell, Haegerich, and Chou, 2016). CBPs developed by New Mexico (New Mexico Department of Health, 2011) and Oklahoma (Oklahoma Board of Nursing and Oklahoma Society of Interventional Pain Physicians, 2013) are adapted from a CBP developed by Utah (Utah Department of Health, 2009).

#### RESEARCH QUESTION 1

*What are existing clinical best practices for management of acute and chronic pain developed by the federal, state and local governments, and medical professional associations?*

Additionally, the ES Report also identifies over 100 policy best practice documents disseminated by federal, state and local governments, as well as medical associations.



### 3.2 Clinical Best Practices

Clinical guidelines can play an important role in pain management. These guidelines therefore also and affect opioid prescription in the current environment of patient risks associated with opioid misuse (National Academies, 2017). Clinical practice guidelines are designed to provide evidence-based information and assist in clinical decision-making to optimize patient care and outcomes. Several recent guidelines for chronic pain management agree on specific recommendations for mitigating opioid-related risk, including upper dosing thresholds, consideration of drug-drug interactions with specific medications and drug–disease interactions, and risk assessment and mitigation (e.g., patient-provider treatment agreements, drug screening/testing; Nuckols et al., 2014). To continue improving pain management in the current environment of opioid-related risks, experts have noted the need to increase the use of guidelines from the CBP as indicated in the specific patients, and access to effective pain management treatments through improvement and adoption of clinical guidelines (Gereau et al., 2014).

#### RESEARCH QUESTION 2

*What are existing knowledge gaps and inconsistencies across identified clinical best practices?*

However, pain management experts have also identified specific research gaps impeding the improvement of pain management guidelines, as well as other needs, including synthesizing and tailoring recommendations across guidelines, types of pain, and populations. Additionally, there are gaps and inconsistencies within and between pain management and opioid prescribing guidelines (Weinberg and Baer, 2017). This is also due to a difference in demographics as the CPB are often in various aspects of the country. A recent review of clinical opioid prescribing guidelines by Barth, Guille, McCauley, and Brady (2017) notes several research needs, including improved for post-operative pain management, as well as evaluation of the implementation and impact of guideline recommendations on patient risk and outcomes. In light of these research gaps, there are potential limitations to evidence-based clinical recommendations that should be considered by pain management providers (Carr, 2017).

In 2016, in response to growing concerns with overprescribing opioids for pain management and opioid-related overdose, CDC published a widely-read guideline on opioid therapy for chronic pain (Dowell and Haegerich, 2016; Dowell et al., 2016). Despite some strengths of the guideline acknowledged by the medical community, responses to this publication illustrate research opportunities and challenges associated with the development of pain management guidelines. For example, the American Medical Association (AMA) stated that it “supports many of the recommendations” and also raised some concerns including the quality of evidence used to support clinical recommendations (AMA, 2016). McBride (2016) noted that the 2016 CDC guideline did not apply to pediatric populations. A commentary by Busse, Juurlink, and Guyatt (2016) identified several limitations to the CDC guideline related to expert selection, evidence inclusion criteria, method of evidence quality grading, support of recommendations with low-quality evidence, and instances of vague recommendations. Deren (2016) noted that in addition to addressing limitations of the CDC guideline, changes in patient and payor expectations are needed to change pain management approaches. Noting that the CDC guideline focuses primarily on patients initiating opioid treatment, Gordon and Connolly (2017) discussed application of the guideline to patients who are already receiving opioid maintenance therapy for chronic pain.

Additionally, reviews of guidelines across different types of pain have raised research questions and identified other needs to improve the application of guidelines to pain management and opioid prescription. A systematic review of CPGs for neuropathic pain by Deng et al. (2016) identified shortcomings across four evaluation domains including stakeholder involvement (i.e., extent to which guideline was developed by the appropriate stakeholders and represents the views of its intended users), rigor of development (i.e.,

process used to gather and synthesize the evidence, as well as the methods to formulate the recommendations), applicability (i.e., likely barriers and facilitators to implementation, strategies to improve uptake, and resource implications of applying the guideline), and editorial independence (i.e., bias in formulation of recommendations). Identified inconsistencies across guidelines for fibromyalgia have demonstrated a need for consensus guideline development (Thieme, Mathys, and Turk, 2017). A review of state-level guidelines for opioid prescriptions found that a minority of states had guidelines specific to emergency departments (Broida, Gronowski, Kalnow, Little, and Lloyd, 2017). Pain guidelines from the World Health Organization are facing a lack of adoption, potentially due to a lack of incorporating contemporary pain management practices (Carlson, 2016).

### 3.2.1 Approaches to Pain Management

The management of chronic and complex pain syndromes is supported by the biopsychosocial model, which views pain through a holistic lens that takes in to consideration the biological, psychological, and social aspects of diagnosis and treatment (Gatchel, McGeary, McGeary, & Lippe, 2014; Gatchel, Peng, Peters, Fuchs, & Turk, 2007). Coupling the biopsychosocial model with multidisciplinary and interdisciplinary approaches yields the best treatment for patients with pain (IOM, 2011). HHS has developed a National Pain Strategy that “recommends a population-based, biopsychosocial approach to pain care that is grounded in scientific evidence, integrated, multimodal, and interdisciplinary, while tailored to an individual patient’s needs” (HHS, 2016). Recent clinical practice guidelines developed by VA and DoD integrate the biopsychosocial model of pain (VA and DoD, 2017), as the Veterans Health Administration (VHA) has identified biopsychosocial care plans as an essential element to effective pain management (Gallagher, 2016). The biopsychosocial approach is applied clinically across pain experiences, including chronic pain (Cheatle, 2016), and specifically to musculoskeletal pain (Booth et al., 2017), low-back back pain (Kamper et al., 2015; Marin et al., 2017), and HIV-related pain (Bruce et al., 2017).

To reflect multidisciplinary approaches and the biopsychosocial model, this section describing clinical best practices is organized by five major approaches to pain management: medication, physical therapy, psychological approaches, surgical and minimally-invasive procedures, complementary and alternative medicine (CAM) interventions, and other clinical recommendations that span across these multidisciplinary approaches. This report also describes CBPs that can be applied across these five approaches. The following sections identify CBPs that address specific aspects of pain management and opioid prescription.

### 3.2.2 Medication

The subsections below describe CBPs addressing medication approaches for pain management such as optimizing treatments based on differences within and between classes of opioids; opioids with abuse deterrent technology; pharmacological alternatives to opioids; medication-assisted treatment; co-prescription of benzodiazepines; and naloxone.

#### 3.2.2.1 Optimizing treatments based on differences within and between classes of opioids

Dose and duration of opioid prescriptions for pain management are influential factors in the potential development of addiction (Wardhan and Chelly, 2017). CDC has estimated that 61 percent of overdose deaths in 2014 involved an opioid (Rudd, 2016). Optimizing opioid treatment may be effective in reducing treatment length and dosing regimens, decreasing side-effect burden, and enhancing effective pain treatment with reduced potential for addiction (Arnstein, Herr, and Butcher, 2017).

#### RESEARCH QUESTION 3B

*How do existing clinical best practices inform guidance on optimizing treatments based on differences between classes of opioids?*

The ES Report did not identify CBPs that directly address optimizing treatments based on differences within and between classes of opioids; however, some related strategies were mentioned. These include utilizing newer weak opioid analgesics (e.g., tramadol, tapentadol, buprenorphine) that do not rely on liver enzyme production of active metabolites and in turn are better tolerated (Arnstein et al., 2017) versus first-line opioid analgesics (e.g., codeine, hydrocodone); prescribing a combination of short- and long-acting opioid analgesics for additive effects and reducing dosing regimens (e.g., morphine and gabapentin for neuropathic pain) (Bruce et al., 2017); and rotating opioids to achieve a better functional outcome and/or reduce adverse effects with opioid therapy, although no substantive published evidence exists to support this strategy (Hegmann et al., 2014). These observations may reflect existing gaps in the understanding of opioid combinations between classes of opioids and their potential additive, synergistic, and antagonistic therapeutic effects.

Currently, there is little evidence describing the adverse effects, therapeutic efficacy, and risk-benefit of opioid combination (Chou et al., 2015; Peng, Zhang, Meng, Liu, and Ji, 2017). While opioids are indicated for selective use in patients with acute and postoperative pain, there is a dearth of quality evidence indicating that opioid analgesic therapy is superior to non-opioid analgesic therapy for improving pain and function (Hegmann et al., 2014). Experts have noted that before addressing opioid optimization, the superiority of opioid analgesic therapy over other approaches needs to be demonstrated (Arnstein et al., 2017; Hegmann et al., 2014). Additionally, better understanding of patient profiles is needed to predict which patients can safely be prescribed opioids without dose escalation (Naliboff et al., 2011).

### 3.2.2.2 Opioids with abuse-deterrent technology

Improvements in abuse-deterrent technologies are being developed with the goal of preventing alterations of prescription opioid formulations and the extraction of the active ingredient by users (FDA, 2017). For example, some abuse-deterrent formulations (ADF) have a hardened tablet surface that prevents crushing, while others turn into a gooey substance upon crushing – both designed to limit the potential for injecting the core substance. ADFs also include adding a pharmaceutical or chemical compound to the opioid to decrease the user's response to the abused substance or provide an adverse reaction when the medication is altered. To address misuse and abuse of prescription opioids, the U.S. Food and Drug Administration (FDA) released guidance in 2015 for the development of opioids formulated to meaningfully deter abuse (FDA, 2015). A challenge to the development of opioid ADFs is the need to maintain the same safety and efficacy profile as the opioid without ADF for FDA approval (FDA, 2016; Moorman-Li et al., 2012).

#### RESEARCH QUESTION 3C

*How do existing clinical best practices inform guidance on opioids with abuse deterrent technology?*

Three CBPs address opioids with abuse-deterrent technology to prevent opioid abuse and reduce adverse effects (Manchikanti et al., 2017). All CBPs acknowledge that ADF opioids, alone, are not sufficient to prevent opioid abuse or misuse and recommend a multifaceted-approach combining ADF opioids with risk evaluation and mitigation strategies (REMS) and prescription drug monitoring and overdose prevention programs as a comprehensive opioid risk management approach to reduce opioid abuse and misuse (Manchikanti et al., 2017; New Mexico Department of Health, 2011; North Carolina Medical Board, 2014). One of the three CBPs also recommends the use of sequestered opioid antagonists such as naloxone to pharmacologically deter abuse by rendering the opioid ineffective, as a better approach compared to ADF opioids (Manchikanti et al., 2017).

To date, some evidence exists that ADF opioids have limited effectiveness and result in unintended consequences (Barnett, Gray, Zink, and Jena, 2017). Post-marketing data have demonstrated that

introduction of ADF opioids reduced illicit route conversion by at least 45 percent, only marginally reduced oral abuse, and resulted in at least 25 percent of users bypassing the ADF opioid mechanism (Cicero and Ellis, 2015; Coplan et al., 2016; Manchikanti et al., 2017). Studies have also demonstrated that reformulated OxyContin® is associated with increased abuse of other opioids, particularly analgesics that are amenable to tampering (Cicero and Ellis, 2015; Turk, Dansie, Wilson, Moskovitz, and Kim, 2014). However, these studies examine one of several existing ADF approaches and do not address whether patients displaying low- and high-risk of abuse are likely to follow similar courses under ADF opioid treatment. Experts have noted that to further examine the abuse-deterrent potential of an opioid formulation, future research efforts can evaluate abuse liability and likelihood of ADF opioid circumvention and calculate the misuse and abuse in patients displaying both low- and high-risk of abuse (Kaye, Jones, Kaye, Ripoll, Jones, et al., 2017).

### 3.2.2.3 Pharmacological alternatives to opioids to reduce opioid monotherapy in appropriate cases

Long-term opioid therapy for pain management is significantly associated with increased risk of opioid disorder, overdose, myocardial infarction, and motor vehicle injury in some pain management populations (Dowell et al., 2016). Pharmacological alternatives to opioids for pain management are not associated with substance use disorder; have a fraction of the number of overdoses associated with opioid analgesics; and may be a favorable treatment option to opioid analgesics for pain management (Jones, Mack, and Paulozzi, 2013; Qaseem, Wilt, McLean, Forciea, and Clinical Guidelines Committee of the American College of Physicians, 2017).

#### RESEARCH QUESTION 3A

*How do existing clinical best practices inform guidance on pharmacological, nonpharmacological, and medical device alternatives to opioids to reduce opioid monotherapy in appropriate cases?*

Twenty-three CBPs recommend pharmacological alternatives to opioids to reduce opioid monotherapy. Recommendations vary per treatment indication and ranged between non-opioid analgesics to adjuvant analgesics to multimodal approaches for pain management. Fifteen CBPs endorse non-opioid analgesics including over-the-counter medications, non-steroidal anti-inflammatory drugs (NSAIDs), and acetaminophen as a first-line pharmacological alternative for acute, mild-to-moderate, and chronic pain. Although acetaminophen is recommended as the preferred non-opioid agent for treatment of acute and mild-to-moderate pain due to decreased side effects (Bruce et al., 2017; Cornelius, Herr, Gordon, Kretzer, and Butcher, 2017; Horgas, 2017), one CBP argued that acetaminophen showed only a moderate effect of pain relief compared to opioids (Manchikanti et al., 2017). For chronic non-responders, NSAIDs are recommended as first-line of treatment, and tramadol or duloxetine as second-line treatment, prior to consideration of opioids (Qaseem et al., 2017). Furthermore, one CBP recommends a multimodal approach combining pharmaceutical alternatives with ablative techniques, acupuncture, nerve blocks, electrical nerve stimulation, physical therapy, and/or psychological treatment as a holistic strategy for chronic pain management (ASA and ASRA, 2010). High-quality evidence also support the use of NSAIDs, gabapentin, pregabalin, and oral celecoxib as part of a multimodal analgesia treatment course for post-operative pain (Chou, Gordon, et al., 2016; Cooney, 2016). In reference to the treatment of neuropathic conditions, three of the 23 CBPs recommend the use of adjuvant analgesics, including antidepressants and selected anticonvulsants (Horgas, 2017; Manchikanti et al., 2017; Paice et al., 2016); however, these recommendations may be inconsistent. Two CBPs indicated adjuvant analgesics as equally or more effective, and with less risk than opioids for neuropathic pain treatment (Horgas, 2017; Washington, 2015); while another highlighted a minimal effect on improvement compared to opioid agents (Manchikanti et al., 2017). These observations suggest potential variations across clinical recommendations for appropriate alternative approaches to pain management.

Experts have noted that while pharmacological interventional therapies can be effective for pain management, they may be associated with renal, gastrointestinal, and liver disease, rendering them a limited treatment option for long-term use (Dowell et al., 2016; Horgas, 2017). Although a multimodal approach is emphasized as a preferred strategy for combating chronic pain, experts note that further evidence is needed about the effectiveness of and compliance with multimodal alternative treatments for pain management compared to unimodal approaches (Manchikanti et al., 2017).

#### **3.2.2.4 Medication-Assisted Treatment**

Opioid use disorders (OUDs) are characterized by compulsive behaviors to self-administer opioids without medical cause or in doses in excess of clinical recommendation (Lagisetty et al., 2017). Medication-assisted treatment (MAT) is the practice of administering an opioid agonist, antagonist, or a combination of the two in conjunction with psychological counseling to help patients with OUD recover (Itzoe and Guarnieri, 2017).

Nine CBPs recommend MAT for patients with OUDs. All CBPs recommend methadone, buprenorphine, naltrexone and/or naloxone in combination with behavioral therapies for patients with OUD after carefully considering the patient's prior treatment history and treatment setting. One CBP recommends incentivizing private physicians to partner with licensed treatment agencies to increase access to MAT to enhance the odds of successful recovery from opioid dependence (Governor's Task Force on Drug Abuse Control, 2017). Another CBP recommends the use of the Screening, Brief Intervention, and Referral to Treatment protocol in acute settings to decrease drug abuse and increase follow-up for treatment programs (Colorado Chapter of the American College of Emergency Physicians, 2017). This CBP also recommends initiation of buprenorphine and naloxone as an effective method for transitioning patients into recovery.

Research has shown that primary care-based models for MAT demonstrate equivalent efficacy compared to specialty substance use treatment facilities and that certain populations have an advantage in improving comorbidity outcomes (Lagisetty et al., 2017). Experts have noted that better a understanding of which core implementation structures and components are effective in primary care-based models of MAT would provide a useful basis for expanding access of MAT to OUD treatment (Korthuis et al., 2017; Lagisetty et al., 2017).

#### **3.2.2.5 Co-prescription of benzodiazepines**

Benzodiazepines are a class of psychoactive agents that depress central nervous system (CNS) activity and are prescribed to relieve anxiety, panic attacks, and seizures (Day, 2013). Studies have shown that co-prescription of opioid analgesics and benzodiazepines is associated with increased adverse side effects and increased risk of fatal and nonfatal overdose (Gudin, Mogali, Jones, and Comer, 2013; Maree, Marcum, Saghafi, Weiner, and Karp, 2016; Weisberg et al., 2015).

Thirteen CBPs address co-prescription of benzodiazepines with opioid analgesics. Seven CBPs recommend clinicians use caution and avoid, when possible, prescribing opioid analgesics with other medications that cause CNS depression such as benzodiazepines, muscle relaxants, and hypnotics. These cautionary recommendations are based on strong evidence of severe drug-drug interactions, including increased risk of side effects and increased risk of over-sedation in chronic opioid therapy (Marin County Department of Health and Human Services, 2015; West Virginia Board of Pharmacy, 2016). One of the seven CBPs specifically recommends that clinicians discuss these increased risks prior to co-prescribing benzodiazepines and to ensure that treatments for depression and other co-occurring mental health conditions were optimized (Tehama County Health Services Agency, 2017). Five CBPs strongly recommend against the concurrent use of benzodiazepines and opioid analgesics due to the increased risk of overdose and death.

There is evidence supporting the associated risks of co-prescribing benzodiazepines in patients with chronic pain (Dowell et al., 2016), HIV (Weisberg et al., 2015), pulmonary disease (Ekström, Bornefalk-Hermansson, Abernethy, and Currow, 2014) and sleep apnea (Paice et al., 2016). However, experts acknowledge that further research is needed to examine overdose outcomes and elucidate which types and what doses of benzodiazepines increase the risk associated with overdose (Brandt and Leong, 2017).

### **3.2.2.6 Naloxone**

Naloxone is a potential life-saving medication capable of reversing CNS depression associated with opioids and restoring normal breathing in overdosed patients (McDonald and Strang, 2016). It was approved in 1971 by the FDA and has been used to reverse the effects of opioid toxicity with minimal adverse effects (Lewis, Vo, and Fishman, 2017). Although naloxone has historically been administered in emergency settings by trained health care providers, recent efforts are being made widely distribute the agent as a take-home kit for use by individuals with high risk of opioid overdose (Lewis et al., 2017; McDonald and Strang, 2016; Wheeler, Jones, Gilbert, Davidson, and CDC, 2015).

Nine CBPs discuss the use of naloxone for overdose prevention. Seven of the nine CBPs recommend clinicians first evaluate patients for factors that increase risk for opioid overdose. These factors include patients with history of overdose, OUD, high opioid-dose prescription, concurrent pain and depression prescriptions, and gaps in opioid-medication use but currently being placed back on previous opioid dosages (Dowell et al., 2016; Manchikanti et al., 2017; Munzing, 2017). All CBPs recommend co-prescribing naloxone to patients exhibiting risk factors for opioid overdose as a risk mitigation strategy. Support for this recommendation comes from moderate-quality evidence that demonstrates take-home naloxone programs are effective in improving overdose survival with minimal adverse events (VA and DoD, 2017). One of the nine CBPs strongly recommends the use of Suboxone®, a sublingual film containing buprenorphine and naloxone, as the most effective method for transitioning OUD patients into recovery (Colorado Chapter of the American College of Emergency Physicians, 2017). Furthermore, three CBPs emphasize the importance of appropriately training family and caregivers of high-risk patients, as well as first responders, in naloxone administration to reduce opioid-related emergency visits (Health Care Association of New Jersey, 2017; Manchikanti et al., 2017; Marin et al., 2017; VA and DoD, 2017).

Systematic reviews have identified naloxone as a life-saving measure following opioid overdose (McDonald and Strang, 2016; VA and DoD, 2017). McDonald et al. (2016) noted that although clinical efficacy has been established for naloxone used on short-acting opioids (e.g., hydromorphone, oxycodone and codeine), efficacy of intervention from long-acting opioids (e.g., methadone, Oxycontin®, extended-release opioids) is unclear and needs further exploration.

### **3.2.3 Physical Therapy**

Physical therapy is a component of biopsychosocial, multidisciplinary approaches to pain management. The subsections below describe CBPs addressing traditional physical therapy approaches and functional restoration.

#### **3.2.3.1 Traditional Physical Therapy**

Physical therapy approaches for pain include therapeutic exercises, manual therapy, application of heating and cooling agents, and ultrasound. Therapeutic exercise can include aerobic exercise, strength training, and flexibility training (Ambrose and Golightly, 2015). Manual therapy includes mobilization and manipulation approaches (Hidalgo, Detrembleur, Hall, Mahaudens, and Nielsens, 2014).

Fourteen CBPs discuss physical therapy approaches for pain management. Four CBPs recommend physical therapy among other non-pharmacological treatment as preferred approaches to opioids (Dowell

et al., 2016; Erie County Opiate Epidemic Task Force, 2016; Horgas, 2017; VA and DoD, 2017). Two CBPs recommend physical therapy as one component of a multimodal approach (Manchikanti et al., 2017; Washington State Agency Medical Directors' Group, 2015). Arnstein et al. (2017) cite evidence that physical therapy, massage, and yoga are beneficial for pain and pain-related side effects in older adults.

Researchers are continuing to investigate evidence supporting the use of various physical therapy modalities for application to different types of pain. A recent review found that clinical guidelines supported the use of physical and exercise therapy, manual therapy, massage, and yoga for chronic, non-cancer pain (CADTH, 2016).

### **3.2.3.2 Functional Restoration**

Functional restoration is based on the biopsychosocial model, viewing pain and disability as a complex and dynamic interaction among physiological, psychological, and social factors that perpetuate or worsen the clinical presentation (Gatchel and Mayer, 2008). Functional restoration seeks to address pain through professional, social, functional, and psychological rehabilitation (Poulain et al., 2010). Functional restoration has been compared to individual physical therapy as potentially more effective for improving outcomes such as returning to work (Jousset et al., 2004; Poulain et al., 2010).

Six CBPs discuss assessment and consideration of functional outcomes in determining use of opioids for pain management (Colorado Chapter of the American College of Emergency Physicians, 2017; Dowell et al., 2016; Mai, Franklin, and Tauben, 2015; Manchikanti et al., 2017; North Carolina Medical Board, 2014; Paice et al., 2016). None of these CBPs discuss functional restoration programs specifically. These observations suggest a potential need for additional research to demonstrate benefits of functional restoration programs for incorporation into CBPs.

Experts are continuing to develop functional restoration programs for the treatment of pain. Tavares Figueiredo et al., (2016) established and achieved educational objectives with pain patients as part of a functional restoration program, with a positive effect on return-to-work outcomes at six and 12 months. Military researchers recently demonstrated the potential benefits of including a patient's significant other in a functional restoration program framework (McGeary et al., 2016). Additionally, investigators have been validating additional measures of function for functional restoration programs (Neblett, Hartzell, et al., 2017; Neblett, Mayer, et al., 2017).

## **3.2.4 Psychological Approaches**

Psychological aspects of pain are a component of diagnosis and treatment within the biopsychosocial and multidisciplinary approaches. The subsections below describe CBPs addressing traditional psychological approaches and self-management of pain.

### **3.2.4.1 Traditional Psychological Interventions**

In recent decades, pain management experts have recognized the role of psychological factors in the experience of pain, and thus the potential for utilizing psychological interventions to manage pain (Manchikanti, Fellows, and Singh, 2002). Psychological interventions for pain include cognitive and behavioral approaches that seek to identify and replace maladaptive cognitive and behavioral responses to pain. These include cognitive behavioral therapy (CBT), acceptance and commitment therapy (ACT), and mindfulness-based cognitive therapy (Kaiser, Mooreville, and Kannan, 2015). Another psychological approach is biofeedback, which measures electrophysiological processes so patients and clinicians can monitor and influence physiological and psychological responses to pain (Neblett, 2016). Mindfulness meditation is thought to address pain by enabling patients to reframe experiences by increasing awareness of present surroundings and sensations (Hilton et al., 2017). Psychological interventions are often

administered as a component of a multidisciplinary approach and can be coupled with medication, physical therapy, and other treatments.

Sixteen CBPs address psychological assessment or treatment interventions. Two CBPs recommend the use of psychological interventions for chronic pain management (ASA and ASRA, 2010; Paice et al., 2016). Bruce et al. (2017) recommend CBT for chronic pain management in HIV patients. One CBP concludes that existing evidence was insufficient to recommend psychological interventions for acute or subacute low-back pain, however, some low- to moderate-quality evidence supported psychological interventions for chronic low-back pain (Qaseem et al., 2017). Generally, most of the 16 identified CBPs recommend psychological assessment or screening of patients at early stages of management. Nine of the 16 identified CBPs were focused specifically on opioid prescription, however, four of these nine noted that non-pharmacological treatments (specifically psychological, behavioral, or cognitive approaches) should be prioritized over opioids (Dowell et al., 2016; Washington State Agency Medical Directors' Group, 2015) or coupled with opioid medication (Chou et al., 2009; Manchikanti et al., 2017). One CBP recommends the use of psychosocial approaches in the treatment of addiction involving opioid use (Kampman and Jarvis, 2015).

Experts have identified research needs in the development of guidelines for psychological interventions in pain management. Kaiser et al. (2015) noted that although several psychological approaches have been shown to successfully modify patient responses to pain, a "gold standard" of treatment has yet to emerge. For example, evidence supporting psychological approaches to low back pain are generally of low- to moderate-quality, or published too long ago to be applicable to modern approaches (Reese and Mittag, 2013).

#### **3.2.4.2 Self-Management**

Self-management is a CBT-based intervention that challenges emotional and behavioral responses to pain with the goal of improving function, mood, and the experience of pain (Cameron, 2012; Mills, Torrance, and Smith, 2016). Self-management "focuses on the patient's ability to manage their own condition rather than treatment being based within the health care system or centered on a health care professional" (Nicholl et al., 2017). Self-management approaches, which can be offered as a component of multidisciplinary care, connect patients to print- and internet-based educational resources including interactive digital applications, toolkits, books, magazines, leaflets, videos, and audio recordings (Mills et al., 2016; Nicholl et al., 2017; Schofield, 2014).

Four CBPs address self-management interventions. Consideration of self-management approaches is recommended among non-pharmacological alternatives to opioid therapy (VA and DoD, 2017) or in combination with medical therapy (Washington State Agency Medical Directors' Group, 2015). One CBP notes that the potential for self-management in older adults with dementia may be limited due to impairment in cognitive capacity (Horgas, 2017).

Experts have noted research needs for the application of self-management interventions for alleviating pain. For example, a systematic review by Nicholl et al. (2017) noted that the evidence base for interactive digital applications supporting self-management of lower back pain is currently weak. Current challenges to self-management for pain include lack of family support, financial barriers, fear of increased activity and poor patient-physician interactions (Bair et al., 2009; Price, Lee, Taylor, Baranowski, and British Pain Society, 2014).

### 3.2.5 Surgical and Minimally Invasive Procedures

Surgical and minimally-invasive procedures can address root causes and symptoms of pain. These procedures can include nerve blocks (Ilfeld, 2017), epidural steroid injections (House, Barrette, Mattie, and McCormick, 2018), radiofrequency ablation of nerves (Bhatia, Peng, and Cohen, 2016), Botox® injections (Patil et al., 2016), cryotherapy (Sullivan, Lyons, Montgomery, and Quinlan-Colwell, 2016), and capsaicin treatment (Derry, Rice, Cole, Tan, and Moore, 2017). The sections below address ultrasound guided blocks and neuromodulation.

#### 3.2.5.1 Ultrasound guided blocks for acute and chronic pain

In recent years, there has been rapid and widespread adoption of ultrasound guidance techniques that enable physicians to perform targeted insertion of catheters and delivery of injections (e.g., local anesthetics) for improved postoperative pain control efficacy and safety (Mariano, Marshall, Urman, and Kaye, 2014). Ultrasound guidance has become increasingly popular for use in various procedures, including nerve blocks for acute and chronic pain (Hurdle, 2016).

Eight CBPs address nerve blocks for pain, two of which discuss ultrasound-guided nerve blocks specifically. Chou et al. (2016) recommend that clinicians be familiar with ultrasound guidance as a part of a broader recommendation to consider surgical site-specific peripheral nerve block regional anesthetic techniques in adults and children for postoperative pain procedures. For example, Bhatnagar and Gupta (2015) recommend ultrasound-guided celiac plexus block for pancreatic cancer pain. In the emergency care setting, administration of nerve blocks in patients with femoral fractures can decrease subsequent opioid use (Kassam, Gough, Davies, & Yarlagaadda, 2018).

Experts continue to assess ultrasound-guided regional anesthesia (Neal et al., 2016), which may also be particularly advantageous for use with young children (Guay, Suresh, & Kopp, 2017). Recent studies have shown that ultrasound-guided nerve blocks reduce postoperative pain opioid analgesic administration (Kim et al., 2016; Qi, Du, Gurnaney, Lu, & Zuo, 2014). Ongoing research needs include development of best practice treatment options that provide information about comparative effectiveness and patient outcomes, as well as evidence describing the efficacy of training strategies such as simulation models (Mariano et al., 2014).

#### 3.2.5.2 Neuromodulation

Neuromodulation techniques utilize device-based electrical or magnetic stimulation techniques to activate central or peripheral nervous system tissue associated with pain pathways to produce analgesia or reduce sensitivity to pain. These electrotherapeutic modalities for pain include spinal cord stimulation for chronic pain (Slavin, 2014; Verrills, Sinclair, and Barnard, 2016), implanted peripheral nerve stimulation for headaches (Reed, 2013), and transcutaneous electrical nerve stimulation (TENS) for acute and chronic pain (Vance, Dailey, Rakel, and Sluka, 2014). Additionally, pulsed electromagnetic field therapy (PEMF) and repetitive magnetic stimulation (rMS) have been applied to neck pain (Kroeling et al., 2013).

Nine CBPs address the application of neuromodulation techniques for pain management. Two CBPs support consideration of neurostimulation as a component of non-pharmacological approaches to pain management (Munzing, 2017; Paice et al., 2016). Two CBPs recommend consideration of TENS as an adjunct to other treatments in postoperative pain (Chou, Gordon, et al., 2016; Cooney, 2016).

Research continues to assess the effectiveness of neuromodulation approaches for multiple types of pain. Preclinical and clinical studies seek a better understanding of spinal cord stimulation while application of the technology has grown quickly in recent years (Chakravarthy, Richter, Christo, Williams, & Guan, 2018; Sdrulla, Guan, & Raja, 2018). Grider et al. (2016) found different levels of evidence supporting the efficacy

of spinal cord stimulation for pain associated with failed back surgery syndrome across different simulation parameters (e.g., high-frequency stimulation, adaptive simulation, burst stimulation). Current research suggests that TENS can be effective for postoperative pain, osteoarthritis, painful diabetic neuropathy, and some acute pain conditions (Vance et al., 2014). Existing evidence for the efficacy and clinical usefulness of electrotherapy modalities, including TENS, PEMF, and rMS, for neck pain is generally of low quality, so additional research is needed to make more firm clinical recommendations (Kroeling et al., 2013).

### 3.2.6 Complementary and Alternative Medicine

Complementary and alternative medicine (CAM) refers to health and wellness approaches not considered to be a part of conventional medicine (Mayo Clinic, 2017). The National Center for Complementary and Integrative Health (NCCIH), formerly known as the National Center for Complementary and Alternative Medicine, defines complementary approaches as those “used together with conventional medicine” and alternative approaches as “used in place of conventional medicine,” noting that most patients who use non-conventional approaches do so in addition to conventional treatments (NCCIH, 2017b). CAM approaches can include acupuncture, dietary/nutritional supplements, massage, yoga, and meditation, and NCCIH recognizes several complementary approaches for pain (NCCIH, 2017a). CBPs generally recommend consideration or prioritization of non-pharmacological approaches to acute and chronic pain in appropriate patient scenarios (ASA and ASRA, 2010; Bruce et al., 2017; Erie County Opiate Epidemic Task Force, 2016; Horgas, 2017; New Mexico Department of Health, 2011; Paice et al., 2016; Qaseem et al., 2017), which include some CAM approaches such as acupuncture. The subsection below describes CBP recommendations addressing acupuncture.

#### RESEARCH QUESTION 3A

*How do existing clinical best practices inform guidance on pharmacological, non-pharmacological, and medical device alternatives to opioids to reduce opioid monotherapy in appropriate cases?*

#### 3.2.6.1 Acupuncture

An estimated three million American adults receive acupuncture each year (Barnes, Bloom, and Nahin, 2008). Acupuncture is most commonly used in chronic pain, with several studies indicating that low-back pain, neck pain, osteoarthritis and knee pain, and migraine headaches were common applications (NCCIH, 2017a). In these cases, acupuncture is known to have physiological effects related to analgesia, but CPGs often debate the evidence-based science and accepted mechanism by which it has persisting effects on chronic pain (Vickers et al., 2012).

Eleven CBPs address acupuncture in the context of pain management. Four CBPs recommend acupuncture among other non-pharmacological approaches that should be applied before or in addition to medication-based interventions (Erie County Opiate Epidemic Task Force, 2016; New Mexico Department of Health, 2011; Paice et al., 2016; Qaseem et al., 2017). Three CBPs generally recommend consideration of acupuncture for pain management (ASA and ASRA, 2010; Bruce et al., 2017; North Carolina Medical Board, 2014). Two CBPs cite evidence that acupuncture can alleviate pain (Cornelius et al., 2017; Horgas, 2017). Two CBPs indicate that existing evidence is insufficient to recommend for or against acupuncture for postoperative pain management (Chou, Gordon, et al., 2016; Cooney, 2016).

Recent reviews and meta-analyses show that acupuncture can reduce pain. A review of randomized control trials concludes that acupuncture is beneficial for low back pain and osteoarthritis of the knee (Nahin, Boineau, Khalsa, Stussman, and Weber, 2016). Cho et al., (2014) examined 13 CPGs and 22 systematic reviews and meta-analyses (SR-MAs) to investigate gaps between traditional medicine interventions of East Asian countries (acupuncture) and current CPGs. The authors conclude that current CPGs underestimate the effectiveness of traditional medicine manual therapy, especially for chronic low

back pain. The authors supported a “moderate” recommendation of acupuncture for chronic low back pain and noted that existing evidence was inconclusive to recommend acupuncture for subacute low back pain. A meta-analysis across 29 randomized controlled trials by Vickers et al. (2012) indicated that acupuncture is associated with more potent placebo or contextual effects compared to other CAM interventions. The authors conclude that acupuncture is effective for the treatment of chronic pain and therefore a reasonable referral option. Despite this research, experts have noted that existing studies have not transformed clinical attitudes about acupuncture for pain (Harris, Lifshitz, and Raz, 2015).

### 3.2.7 Other Considerations of Importance

Some CBPs can potentially be applied across the five multidisciplinary and biopsychosocial treatment approaches discussed above. The sections below describe CBPs addressing patient engagement (including patient-provider discussion of goal and expectations) and risk assessment and mitigation (including screening and monitoring), as well as management of high-risk populations.

#### 3.2.7.1 Patient Engagement

Experts have recognized the need to improve patient-provider communication in pain management (Frantsve and Kerns, 2007). Patient engagement approaches are a component of more effective patient-provider communication, enabling patients to actively participate in management of their pain experience and improve outcomes. Patient engagement approaches include formalized discussions between patients and providers about goals, expectations and risks of treatment, and documented contracts or agreements between patient and provider. Education materials can also engage patients by providing information about pain management tools and resources (Washington State Agency Medical Directors’ Group, 2015), as well as instructions for proper storage and/or disposal of opioid medication to prevent non-medical usage of prescriptions (Hawaii Chapter of the American College of Emergency Physicians, 2012; Marin County Department of Health and Human Services, 2015; New Mexico Department of Health, 2011; Oklahoma Board of Nursing and Oklahoma Society of Interventional Pain Physicians, 2013; Utah Department of Health, 2009). The subsection below describes CBPs addressing patient-provider discussion of goals and expectations.

##### 3.2.7.1.1 Discussion of goals and expectations

Establishing goals and expectations can help patients understand potential treatment outcomes of pain relief and improvement in function, enabling a joint decision between patient and physician on initiation of opioid therapy (Manchikanti et al., 2017). A common understanding between patient and provider can be documented in a patient-provider contract, which is a written, formalized agreement detailing the responsibilities of both participants in the treatment process with opioids and controlled substances (Albrecht et al., 2015).

Twenty-six CBPs address discussions between physician and patients about the use of opioids for pain. Eight CBPs recommend discussion between provider and patient about goals, benefits, expectations, and/or risks of opioid therapy (Chou et al., 2014; Dowell et al., 2016; Erie County Opiate Epidemic Task Force, 2016; Manchikanti et al., 2017; Qaseem et al., 2017; Tehama County Health Services Agency, 2017), with some recommending that clinicians provide this information to the patient’s primary caregiver or guardian (North Carolina Medical Board, 2014; Oregon Health Authority, 2017). Four CBPs recommend inclusion of a written patient-provider agreement documenting goals, benefits, expectations, and/or risks before initiating opioid treatment for pain (Chou et al., 2014; Manchikanti et al., 2017; Oklahoma Board of Nursing and Oklahoma Society of Interventional Pain Physicians, 2013; West Virginia Board of Pharmacy, 2016).

Research needs remain regarding how patient-provider communication can enhance pain management. A review by Geurts et al. (2017) concludes that better informing patients about pain management treatment processes could help to increase patient satisfaction. Additionally, perceptions about effectiveness and legal status of patient-provider agreements need to be addressed with additional research and patient-centered design of agreement documentation (Albrecht et al., 2015).

### 3.2.7.2 Risk Assessment and Mitigation

Despite known risks of opioid use disorders, some patients do not develop these problems following prescription of opioid analgesics for pain. Therefore, it is important to conduct risk stratification for patient populations. There is a significant need for identifying and mitigating risks of opioid misuse and diversion (Kaye, Jones, Kaye, Ripoll, Galan, et al., 2017). Risk assessment approaches seek to identify patients at the early stages of the pain management processes and follow them across the treatment process should additional interventions be needed to optimize treatment and avert opioid misuse. The subsections below describe CBPs addressing screening and monitoring, as well as management of high-risk populations.

#### 3.2.7.2.1 Screening and Monitoring

Screening and monitoring in pain management seeks to identify and reduce the risk of opioid misuse and addiction, as well as improve overall patient care. Screening and monitoring approaches include screening tools, assessment of patient physical and psychological history, urine testing, and prescription drug monitoring programs (PDMPs). These approaches seek to enable providers to identify high-risk patients in order for them to consider substance misuse interventions, ADFs, and education materials to mitigate opioid misuse (Kaye, Jones, Kaye, Ripoll, Jones, et al., 2017).

Thirty-three CBPs address screening and monitoring. Most of these CBPs recommend that clinicians screen patient history for substance use and/or conduct thorough physical and psychological evaluations to screen for risk factors and characterize pain to inform treatment. Thirteen CBPs recommend preliminary or random urine drug testing. Nine CBPs recommend that clinicians check PDMPs when prescribing opioid medication (Dowell et al., 2016; Erie County Opiate Epidemic Task Force, 2016; Hegmann et al., 2014; Horgas, 2017; Mai et al., 2015; Manchikanti et al., 2017; Munzing, 2017; Tehama County Health Services Agency, 2017; VA and DoD, 2017).

Although experts note there are some limitations in evidence assessing the impact of conducting a patient history on pain outcomes (ASA and ASRA, 2010; Hegmann et al., 2014), a comprehensive history (including physical examination) in addition to screening and monitoring is generally recommended. Tailoring these approaches to patient needs will be necessary, as there is a lack of screening and monitoring tools that can be applied universally across all pain scenarios (Solanki, Koyalagunta, Shah, Silverman, and Manchikanti, 2011). Additionally, there is no single tool capable of reliably and accurately predicting which patients need increased abuse monitoring or are unsuitable for opioid therapy (Kaye, Jones, Kaye, Ripoll, Galan, et al., 2017).

#### 3.2.7.2.2 Management of high-risk populations who receive opioids in the course of medical care, other than for pain management

Given the risk of opioid misuse and abuse, it is important to consider how best to treat pain in individuals at high risk of addiction. Patients taking opioids are at increased risk of opioid use disorder, opioid overdose, and other adverse outcomes (National

#### RESEARCH QUESTION 3D

*How do existing clinical best practices inform guidance on management of high-risk populations who receive opioids in the course of medical care, other than for pain management?*

Academies, 2017). Additionally, there are concerns about how to treat post-operative pain in patients with substance abuse and/or opioid use disorders (Barth et al., 2017).

CPGs identified by the ES Report address several components of pain management in patients at high risk of addiction, including prioritization of non-opioid interventions (see Section 3.2.2.3), consideration of abuse deterrent technology (see Section 3.2.2.2), medication-assisted treatment (Section 3.2.2.4), provision of naloxone (Section 3.2.2.6), and prioritization of non-pharmacological treatments (Section 3.2.6). One CBP focused specifically on clinical recommendations for treatment of addiction involving opioid use (Kampman and Jarvis, 2015). An overall multimodal approach depending on the type of surgery or procedure is recommended (HHS, 2016).

### 3.3 Policy Best Practices

Policy recommendations can support clinical recommendations identified through CBP guidance by identifying legislative or other actions that can provide resources and eliminating barriers to enable improved pain management. Many policy activities also support non-clinical needs relevant to pain management in the current environment of opioids and associated risks. The sections below provide an overview of policy best practices informing risk assessment and mitigation; patient education; provider education; access to care; medication-assisted treatment; provision of naloxone; parity laws; fentanyl detection; and stigma.

#### RESEARCH QUESTION 4

*How do non-clinical (i.e., policy-related) best practices advance and support clinical best practices for management of acute and chronic pain?*

#### 3.3.1 Risk Assessment and Mitigation

Several government and stakeholder organizations have made policy recommendations or taken specific policy actions to enable providers to assess and mitigate patient risks associated with pain management medication. For example, Colorado, West Virginia and Washington support screening patients for prior history of substance use at the early stages of treatment (Colorado Chapter of the American College of Emergency Physicians, 2017; Washington State Agency Medical Directors' Group, 2015; West Virginia Board of Pharmacy, 2016). Additionally, both New Jersey and Maine have recommend an increase in early intervention screenings at schools for youths that are at-risk for SUDs (Delahanty III, Mills, and Morris, 2016; Governor's Task Force on Drug Abuse Control, 2017). The Connecticut Opioid REsponse (CORE) initiative has supported partnership development between treatment programs and clinicians who provide screening and referral, and has also developed emergency department-based programs for screening, brief intervention, and treatment initiation with buprenorphine (Connecticut, 2016). States have also supported early or random urine testing to identify at-risk patients (Arizona Department of Health Services, 2017; Oregon Health Authority, 2017), and Pennsylvania is currently investigating methods for more precise detection and determination of alcohol and controlled substances in urine and blood samples (Pennsylvania, 2015). Rhode Island encourages the standardized use of urine-drug testing to screen for benzodiazepine/opioid co-ingestion for opioid treatment programs (Rhode Island, 2015). The utility of written patient-provider agreements has also been recognized at the state level (West Virginia Board of Pharmacy, 2016).

The need to modernize and provide adequate funding for PDMPs is widely acknowledged (AMA, 2015; Carrizosa and Latham, 2017; Massachusetts Department of Public Health, 2015; South Dakota Department of Health, 2017). Provider PDMP adoption has shown to be reduced when interoperability is low and use isn't mandated (Barnett et al., 2017). Colorado favors the integration of automatic queries and responses that obviate time-consuming manual data entry, and also recommends that PDMPs be optimized with

improvements such as automatic queries, links to emergency department registration, and data population in electronic medical records (Colorado Chapter of the American College of Emergency Physicians, 2017). Maryland also recommends enhanced user interfaces and interstate data sharing for PDMPs (Carrizosa and Latham, 2017).

As discussed below (3.3.2 and 3.3.3), policy actions and recommendations to enhance physician and patient education resources can help mitigate risks of abuse and diversion.

### 3.3.2 Patient Education

Patient education resources can complement pain management strategies by strengthening patient understanding of opioid risk and benefits, and are critical components of self-management treatment approaches (see Section 3.2.4.2). Patient education resources include toolkits, books, magazines, leaflets, videos, and audio recordings (SAMHSA, 2016; Washington State Agency Medical Directors' Group, 2015).

Stakeholder organizations and individual states have recognized the benefits of educating patients and surrogates about the known risks and realistic benefits of treatment prior to initiating opioid therapy (Colorado Chapter of the American College of Emergency Physicians, 2017; Governor's Task Force on Drug Abuse Control, 2017; Massachusetts Department of Public Health, 2015; North Carolina Medical Board, 2014; Oregon Health Authority, 2017; Tehama County Health Services Agency, 2017). Local elected leaders have implemented traditional methods of resource dissemination, such as town hall meetings and pamphlets, but are now also exploring newer platforms such as Facebook and Twitter to reach out to their constituents (NACo-NLC, 2016). Mass-media campaigns have been seen in both the private and public sectors; for example, New Jersey has implemented a campaign around preventing opioid addiction by launching a help hotline and website, and the Partnership for Drug-Free Kids has worked with private-sector partners such as Google to run public service announcements that inform parents about available help for their loved ones (President's Commission on Combating Drug Addiction and the Opioid Crisis, 2017a). Several stakeholders have also published opioid-overdose toolkits and guidelines that provide patients and family members with opioid safety advice, general recommendations, and additional resources for overdose prevention (SAMHSA, 2016; Washington State Agency Medical Directors' Group, 2015).

### 3.3.3 Provider Education

Health care professionals who prescribe opioids are in a key position to balance the benefits of analgesics against the risk of adverse clinical outcomes. It is estimated that "apart from federal prescribers who are required to be trained, fewer than 20% of the over one million prescribers licensed to prescribe controlled substances to patients have training on how to prescribe opioids safely" (President's Commission on Combating Drug Addiction and the Opioid Crisis, 2017b). Health care providers can access educational resources, receive accreditation, or renew existing licenses through public- or private-sector enterprises (Carrizosa and Latham, 2017). Stakeholders have recommended that accrediting organizations develop, review, promulgate, and regularly update core competencies for pain care education and licensure and certification at the pre-licensure (undergraduate) and post-licensure (graduate) levels (HHS, 2016; NACo-NLC, 2016).

Stakeholder organizations and individual states have recognized the benefits of additional provider education resources (Dowell et al., 2016; Massachusetts Department of Public Health, 2015; Oregon Health Authority, 2015; SAMHSA and OSG, 2016). Released in 2017, the President's Commission on Combating Drug Addiction and the Opioid Crisis recommends mandating medical education training in opioid prescribing and risks of developing substance abuse disorder (President's Commission on

Combating Drug Addiction and the Opioid Crisis, 2017a). The Presidential Commission also recommends development of national training standards and provision of training courses coordinated between government organizations and the medical community. The National Pain Strategy recommends development of a pain education portal to provide standardized education materials applicable to the continuum of pain (HHS, 2016).

### 3.3.4 Access to Care

Chronic pain affects as many as 100 million Americans (National Academies, 2017), many of whom face significant barriers to accessing medical and other pain management resources (Kampman and Jarvis, 2015; NACCHO, 2016). Several organizations have identified policy recommendations to close gaps in access to pain management services (AAPM, 2014; Pennsylvania, 2015). For example, the American Academy of Pain Medicine recommends developing a program of mandatory insurance benefits to address barriers to treatment for chronic pain (AAPM, 2014).

Given the risk of addiction and OUD in the current environment of pain management, the need to provide greater access to substance abuse services has become clear (Kampman and Jarvis, 2015). An estimated 80 percent of people with an opioid addiction are not receiving treatment for substance use disorders (Saloner and Karthikeyan, 2015). The National Academy of Medicine recommends that states provide universal access to evidence-based treatment for OUD (National Academies, 2017). Several organizations recommend increasing service and delivery capacity for treatment of substance- and opioid-related addiction (AMA, 2015; CMS, 2016; NGA, 2016). One way of increasing treatment capacity could be allowing states to waive the Institutions for Mental Diseases (IMD) exclusion, which prohibits Medicaid reimbursement of substance abuse services provided within inpatient facilities of more than 16 beds (NGA, 2016; President's Commission on Combating Drug Addiction and the Opioid Crisis, 2017a; WH ONDCP, 2017), or eliminating the IMD exclusion altogether. Individual states have recommended increasing access to substance abuse treatment and resources (California Department of Public Health, 2016; Massachusetts Department of Public Health, 2015; Minnesota Department of Human Services, Alcohol and Drug Abuse Division, 2017), and many states have enacted legislation designed to enhance access to care (National Association of State Alcohol and Drug Abuse Directors, 2015). Additionally, the National Governor's Association has outlined several policy mechanisms for expanding access to treatment and recovery resources, including allowing nurse practitioners, physician assistants, and medical residents to prescribe buprenorphine for opioid addiction; lifting or eliminating provider caps on the number of patients treated with buprenorphine; and ensuring that providers have access to patients' substance abuse disorder treatment information (NGA, 2016).

### 3.3.5 Medication-Assisted Treatment Access

As discussed above (see Section [3.2.2.4](#)), MAT generally includes the usage of methadone, buprenorphine, or naltrexone specifically tailored toward individual patient needs (Massachusetts Department of Public Health, 2015; Rhode Island, 2015).

Several stakeholder organizations have made policy recommendations to increase access to MATs. The American Academy of Pain Medicine recommends and has supported legislative actions that limit inappropriate prescribing, and at the same time, allow patients who suffer from moderate to severe pain to access proper medication (AAPM, 2013). Stakeholders also recommend provider collaboration and increased funding to further enhance MAT through community-service boards, drug-treatment courts, or jail-based treatment (NACo-NLC, 2016; NGA, 2015; ONDCP, 2016). Several local leaders and stakeholder

organizations also recommend an expansion of insurance coverage for addiction treatments and a removal of limits on such treatments (NACo-NLC, 2016).

Individual states have identified policy actions designed to increase access to MAT. Minnesota is currently exploring telehealth-supported infrastructure to expand office-based opioid treatment and is pushing for an increased workforce of buprenorphine-waivered prescribers (Minnesota Department of Human Services, Alcohol and Drug Abuse Division, 2017). Rhode Island is further building a capacity for MAT delivery by developing “Centers of Excellence for the Treatment of Opioid Problems” and removing administrative barriers, such as the prior authorization associated with buprenorphine; expanding MAT to new care settings by encouraging cross-institution collaboration and offering MATs for those undergoing detoxification services; and optimizing delivery of MATs in existing care settings by reducing payment barriers to opioid treatment (Rhode Island, 2015). Additionally, several states are advocating for an increase in access to MAT (Governor’s Task Force on Drug Abuse Control, 2017; Massachusetts Department of Public Health, 2015; Pennsylvania Department of Drug and Alcohol Programs, 2015).

### 3.3.6 Provision of Naloxone

An estimated 50,000 deaths are associated each year with opioid overdose in the US (Rudd, Aleshire, Zibbell, and Gladden, 2016). As discussed above (see Section [3.2.2.6](#)), naloxone can prevent opioid overdose by blocking opiate receptor sites if treatment is initiated as early as possible, even before the arrival of emergency medical services at the scene (SAMHSA, 2016). Improving access to naloxone would enable emergency responders and other providers to administer timely interventions in overdose scenarios and save lives.

Stakeholder organizations and individual states have identified and/or executed policy actions that can increase access to and provision of naloxone. The National Association of State Alcohol and Drug Abuse Directors (NASADAD) has identified 40 states and the District of Columbia that have passed laws to expand the availability of naloxone (NASADAD, 2015). The most common details from those laws include: third-party prescription, standing orders, liability protections, naloxone distribution programs, educational strategies, and over-the-counter naloxone (NASADAD, 2015). Several stakeholders and individual states also recommend developing additional best practice guidance for addiction treatment and distribution of naloxone (NACo-NLC, 2016; New York Heroin and Opioid Task Force, Task Force Heroin and Opioid Task Force, New York, and New York, 2016; NGA, 2016). Pennsylvania is working with lawmakers to allow law enforcement to administer naloxone, and is also working to create continuing medical education on naloxone co-prescribing (Pennsylvania Department of Drug and Alcohol Programs, 2015). Oregon passed a law in 2013 that allowed the establishment of medically-supervised lay-person (non-medical professional) naloxone rescue (Oregon Health Authority, 2015). Additionally, in 2015, the NYC Health Commissioner authorized an order to make naloxone available without a prescription in participating pharmacies (City of New York Office of the Mayor, 2017).

### 3.3.7 Parity Laws

Parity laws legally recognize mental health conditions and substance abuse as equal to physical illness. The Mental Health Parity and Addiction Equity Act (MHPAEA) of 2008 requires group health plans and health insurance companies to guarantee that the financial requirements and treatment limitations for SUD and mental health disorder benefits are no more restrictive than the financial requirements or treatment limitations applied to medical and surgical benefits (ONDCP, 2016).

Ongoing policy and legislative activities in the past two decades have sought to ensure equal clinical attention to SUDs and addiction (NGA, 2015; ONDCP, 2016). In 2008, VA included SUD treatment in the

VHA *Handbook on Uniform Mental Health Services in VA Medical Centers and Clinics*, which details the benefits available to enrollees (ONDCP, 2016). In 2013, DoD expedited changes to the TRICARE policy manuals to allow for the provision of medication-assisted treatment in TRICARE-authorized SUD treatment facilities (ONDCP, 2016). In 2015, HB 1747 was enacted, requiring the State Corporation Commission's Bureau of Insurance to develop reporting requirements regarding denied claims complaints and appeals involving coverage for behavioral health benefits (NGA, 2015). In 2016, the Centers for Medicare and Medicaid Services (CMS) issued a regulation applying the parity standards to explain how the MHPAEA applies to Medicaid managed-care organizations, Medicaid alternative benefit plans and the Children's Health Insurance Program benefits (ONDCP, 2016). Several states are enacting policy requirements that further enforce legislative parity laws (Louisiana Commission on Preventing Opioid Abuse, 2016; Massachusetts Department of Public Health, 2015). Arizona is convening an Parity Task Force to research and provide recommendations regarding parity and standardization across the state (Arizona Department of Health Services, 2017).

### 3.3.8 Illicit Fentanyl Detection

Fentanyl and fentanyl analogues represent a current and emerging threat in the US as a pure illicit narcotic and in mixtures with other substances (ONDCP, 2016). Fentanyl, which has legal medical use in the operating room and in some topical patch applications, may be 50-100 times more potent than morphine and 30-50 times more potent than heroin; carfentanil, which is structurally related to fentanyl, is up to 10,000 times more potent than morphine (DEA, 2017; ONDCP, 2016). Due to the dangerous health and abuse risks associated with illicit use of these compounds, policies facilitating rapid and comprehensive detection are needed.

Several stakeholder organizations have worked to curtail fentanyl overdose through various forms of drug testing. CDC recommends that public health departments explore methods for more rapid detection of overdose outbreaks by using existing surveillance systems such as medical examiner data, emergency medical services data, or near real-time emergency department data (CDC National Center for Injury Prevention and Control, 2017). The use of enzyme-linked immunosorbent assay is also recommended to medical examiners and coroners to detect fentanyl (CDC National Center for Injury Prevention and Control, 2017). The US Drug Enforcement Agency is currently evaluating detection devices for use in field-testing for the presence of fentanyl and fentanyl analogues (DEA, 2017). Fentanyl test strips are common and have been distributed by various stakeholder organizations and public health departments (Committee on Energy and Commerce and Subcommittee on Oversight and Investigations, 2017). The National Institute on Drug Abuse (NIDA) has funded the National Drug Early Warning System (NDEWS), which uses multiple sources of data to monitor fentanyl use. NDEWS traces drug use patterns and trends in sentinel communities and across the nation (Committee on Energy and Commerce and Subcommittee on Oversight and Investigations, 2017). NIDA is also funding a study to explore the use of "paper spray" mass spectrometry, which simplifies the testing process, and disposable paper spray cartridges, which automate the preparation of the same for testing (Committee on Energy and Commerce and Subcommittee on Oversight and Investigations, 2017). Private sector initiatives have also invested in updated handheld spectrometers to allow law enforcement officers and customs officials to scan pills, powders, and other various unknown substances (Hiolski, 2017).

### 3.3.9 Stigma

Stigma remains a significant barrier to implementation of programs and treatments seeking to address opioid-related risks of pain management, including MAT (Chou, Korthuis, et al., 2016; Salsitz and Wiegand, 2016) and naloxone (Winstanley, Clark, Feinberg, and Wilder, 2016). Stigma not only makes individuals

less likely to seek treatment, but it also makes marshaling investment more challenging for prevention and treatment programs associated with substance abuse (SAMHSA and OSG, 2016).

Stakeholder organizations and individual states have sought to reduce stigma-associated barriers to prevention and treatment for individuals with substance abuse needs stemming from opioid-based pain management approaches (AMA, 2015; Delahanty III et al., 2016; HHS, 2016; Massachusetts Department of Public Health, 2015; RWJF, 2017). Maine is increasing public awareness by hiring marketing firms to create comprehensive statewide education campaigns, engaging youth in developing messages and social media content, and utilizing the Addicting Technology Transfer Center's anti-stigma toolkit (Delahanty III et al., 2016). Connecticut is working with media outlets and state agencies to increase the dissemination of accurate, evidence-based, and non-stigmatizing information on the causes, manifestations, and treatments of SUDs (Connecticut, 2016). South Carolina recommends additional education and accurate information about the risks and benefits of treatment to directly tackle bias related to stigma (Governor's Prescription Drug Abuse Prevention Council, 2014). Massachusetts and California are also creating public awareness campaigns focused on reframing addiction as a medical disease and promoting medication safety practices (California Department of Public Health, 2016; Massachusetts Department of Public Health, 2015). Strong community engagement and advocacy are also necessary to overcome the stigma associated with substance use disorders and behavioral health conditions in order to build support for community-based treatment and expansion of MATs (RWJF, 2017).

## ACRONYMS

ADF	Abuse-deterrent formulations
CAM	Complementary and alternative medicine
CARA	Comprehensive Addiction and Recovery Act
CBP	Clinical best practice
CBT	Cognitive behavioral therapy
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare and Medicaid Services
CNS	Central nervous system
CPG	Clinical practice guideline
DoD	Department of Defense
ES	Environmental scan
FDA	Food and Drug Administration
HHS	Department of Health and Human Services
IASP	International Association for the Study of Pain
IMD	Institutions for Mental Diseases
MAT	Medication-assisted treatment
MHPAEA	Mental Health and Addiction Equity Act
NCCIH	National Center for Complementary and Integrative Health
NDEWS	National Drug Early Warning System
NGA	National Governors Association
NIDA	National Institute on Drug Abuse
NSAIDs	Non-steroidal anti-inflammatory drugs
OUD	Opioid use disorders
PDMP	Prescription Drug Monitoring Program
PEMF	Pulsed electromagnetic field therapy
PMTF	Pain Management Task Force
rMS	Repetitive magnetic stimulation
SUD	Substance Use Disorder
TENS	Transcutaneous electrical nerve stimulation
VA	Department of Veterans Affairs
VHA	Veterans Health Administration

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## APPENDIX A: RESEARCH LITERATURE SEARCH

The ES Report includes a search for scientific and medical research literature disseminating CBPs, as well as publications discussing impact and signification of CBPs. The research literature search consists of the following steps:

1. Search strings constructed by combining terms from Columns A, B, and C from Table 2 below
2. Search results narrowed according to search limits below
3. Manual review of resulting article titles and abstracts to identify articles potentially relevant to directly addressing research questions
4. Review of full text articles to determine if relevant to directly addressing research questions
5. Search limits:
  - a. Publications directly addressing research questions
  - b. English language articles only
  - c. Review of articles includes those published since 2012; however, articles published prior to 2012 are included if considered fundamental to understanding the research questions

Table 2: Search Terms

Best Practices (Column A)	Pain Management (Column B)	Interventions (Column C)
<ul style="list-style-type: none"> <li>• clinical guidelines</li> <li>• clinical practice guidelines</li> <li>• treatment guidelines</li> <li>• treatment gaps</li> <li>• research gaps</li> </ul>	<ul style="list-style-type: none"> <li>• pain treatment</li> <li>• pain medicine</li> <li>• pain management</li> <li>• chronic pain</li> <li>• acute pain</li> </ul>	<ul style="list-style-type: none"> <li>• pharmacologic</li> <li>• non-pharmacologic</li> <li>• intervention</li> <li>• acupuncture</li> <li>• opioid</li> <li>• medication assisted treatment</li> <li>• medication-assisted treatment</li> <li>• methadone</li> <li>• buprenorphine</li> <li>• naltrexone</li> <li>• neuromodulation</li> <li>• ultrasound guided blocks</li> <li>• nerve blocks</li> <li>• biopsychosocial model</li> <li>• multidisciplinary</li> <li>• functional restoration</li> <li>• self-management</li> </ul>

## APPENDIX B: STAKEHOLDER ORGANIZATIONS SEARCH

The ES Report includes a search for CBPs disseminated by pain management stakeholder organization using a Google search for websites of pain management stakeholder organizations to identify best practices developed, disseminated, or endorsed by these organizations (Table 3). In addition to federal stakeholder organizations, the search targets non-federal organizations, including private sector, non-profit, and medical associations. Google search terms include names of stakeholder organizations (Table 3) and search terms from Appendix A.

Table 3: Pain Management Stakeholder Organizations

Federal	Non-Federal
<ul style="list-style-type: none"> <li>• Office of National Drug Control Policy (ONDCP)</li> <li>• Domestic Policy Council of the United States</li> <li>• Department of Health and Human Services (HHS)                             <ul style="list-style-type: none"> <li>○ Centers for Medicare and Medicaid Services (CMS)</li> <li>○ Agency for Healthcare Research and Quality (AHRQ)</li> <li>○ Food and Drug Administration (FDA)</li> <li>○ Centers for Disease Control and Prevention (CDC)</li> <li>○ National Institutes of Health (NIH)</li> <li>○ National Institute on Drug Abuse (NIDA)</li> <li>○ Office of the National Coordinator for Health Information Technology (ONC)</li> <li>○ Office of the Assistant Secretary for Health (OASH)</li> <li>○ Office of the Surgeon General</li> <li>○ Substance Abuse and Mental Health Services Administration (SAMHSA)</li> <li>○ Pain Management Research Interagency (within NIH)</li> <li>○ The National Center for Injury Prevention and Control (NCIPC) Board of Scientific Counselors (within CDC)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• American Society of Interventional Pain Physicians</li> <li>• American Chronic Pain Association</li> <li>• American Society of Anesthesiologists</li> <li>• American Society of Regional Anesthesia and Pain Medicine</li> <li>• American Cancer Society</li> <li>• American Academy of Pain Management</li> <li>• American Medical Association</li> <li>• American College of Medical Toxicology</li> <li>• American Pain Society</li> <li>• American Academy of Pediatrics</li> <li>• American Society of Hematology</li> <li>• American College of Obstetrics and Gynecology</li> <li>• American Society of Addiction Medicine</li> <li>• American Academy of Pain Medicine</li> <li>• American Society of Clinical Oncology</li> <li>• American Geriatrics Society</li> <li>• American Academy of Neurology</li> <li>• American Academy of Physical Medicine and Rehabilitation</li> <li>• American Society of Interventional Pain Physicians</li> <li>• American Hospital Association</li> <li>• Physicians for Responsible Opioid Prescribing</li> <li>• American Association of Nurse Practitioners</li> <li>• American Society of Neurosurgery</li> <li>• American College of Surgeons</li> <li>• American College of Radiology</li> <li>• Society of Clinical Psychology</li> </ul>

## APPENDIX C: CONFERENCES SEARCH

The ES Report utilizes a Google search for pain management conference websites (Table 4) to identify best practices or publications describing background, development, effectiveness, and/or impact of best practices disseminated since 2012. Google search terms include names of conferences (Table 4) and search terms from Appendix A.

Table 4: Pain Management Conference Websites

Conference and/or Medical Society	Date
American Society of Anesthesiologists: Annual Meeting	2012 - 2017
American Society of Interventional Pain Physicians: Annual Meeting	2012 - 2017
American Academy of Pain Medicine (AAPM) Annual Meeting	2012 - 2017
American Pain Society: Annual Meeting	2012 - 2017
American Association of Nurse Practitioners (AAPN)	2012 - 2017
American Society of Regional Anesthesia (ASRA) and Pain Medicine: Annual Meeting	2012 - 2017
American Academy of Addiction Psychiatry (AAAP): Annual Meeting and Scientific Symposium	2012 - 2017
Society of Clinical Psychology	2012 - 2017
Physicians for Responsible Opioid Prescribing	2012 - 2017
National Governors Association Meeting	2012 - 2017
National Rx Drug Abuse and Heroin Summit (Atlanta, GA)	2017
North American Drug Dialogue (Washington, DC)	2017
Fentanyl: The Next Wave of the Opioid Crisis – House Energy and Commerce (Washington, DC)	2017
The President's Forum: The U.S. Opioid Epidemic – The National Academy of Medicine (Washington, DC)	2017
CADCA's 28 <sup>th</sup> Annual National Leadership Forum and SAMHSA's 14 <sup>th</sup> Prevention Day (National Harbor, MD)	2017
HHS Opioid Symposium (Washington, DC)	2017
2017 International Conference on Opioids (Boston, MA)	2017
Combating the Opioid Epidemic: A Conversation with the U.S. Surgeon General – CSIS (Washington, DC)	2017

## APPENDIX D: STATE AND LOCAL SEARCH

The ES Report includes a search for CBPs on state and local county websites utilizing various search terms on Google. The state and local search includes the following steps:

1. Google search strings constructed by combination terms from Columns A, B and C from Table 5
2. Manual review of results (websites) from the top two pages of Google to identify reports or publications potentially relevant to directly addressing research questions
  - a. Manual search and review of websites for top 50 counties (per capita opioid prescribing rate [CDC data]) if the county website is not included in (2) above.
3. Search results narrowed according to search limits below
4. Review of full text of identified articles to determine if relevant to directly addressing research questions
5. Search limits:
  - a. Publications directly addressing research questions
  - b. English language articles only
  - c. Review of articles included published works since 2012; however, articles published prior to 2012 were included if considered fundamental to understanding the research questions

Table 5: Search Terms

State or County (Column A)	Pain Management (Column B)	Clinical Best Practice (Column C)
<ul style="list-style-type: none"> <li>• local</li> <li>• city</li> <li>• county</li> <li>• states<sup>1</sup></li> <li>• top 50 counties<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• opioid</li> <li>• prescribing</li> <li>• pain management</li> <li>• chronic pain</li> <li>• acute pain</li> </ul>	<ul style="list-style-type: none"> <li>• guidelines</li> <li>• reports</li> <li>• action plans</li> <li>• clinical practice guidelines</li> <li>• clinical best practices</li> <li>• opioid</li> <li>• medication-assisted treatment</li> </ul>

<sup>1</sup> Includes Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming, and the District of Columbia

<sup>2</sup> Includes Norton, VA; Martinsville, VA; Galax, VA; Emporia, VA; Franklin City, VA; Owsley, KY; Bell, KY; Whitley, KY; Hardin, IL; Lexington, VA; Walker, AL; Covington, VA; Floyd, KY; Franklin, AL; Colonial Heights, VA; Ware, GA; Pike, KY; Clay, KY; Saline, IL; Forrest, MS; Leslie, KY; Perry, KY; Colbert, AL; Salem, VA; Waynesboro, VA; Ben Hill, GA; Campbell, TN; Wise, VA; Logan, WV; Haralson, GA; Evangeline, LA; Scotland, NC; Marshall, AL; Clay, TN; Claiborne, TN; Henry, TN; Cocke, TN; Harmon, OK; Breathitt, KY; Dickenson, VA; Pratt, KS; McCracken, KY; Marion, MS; Marion, AL; Butler, MO; Fulton, KY; Tazewell, VA; Danville, VA; Seminole, GA; Fentress, TN. Identified from CDC's data on opioid prescribing rates per capita.

## APPENDIX E: CLINICAL BEST PRACTICES ANALYSIS

The Clinical Best Practices Analysis has been can be viewed in the embedded Excel file below.



CBP Analysis  
Appendix E 2018011