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Use and Adoption of Complementary and Integrative Health Therapies in the Veterans Health Administration for Veterans with Chronic Pain

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**Publication Date**

2022

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA

Los Angeles

Use and Adoption of Complementary and Integrative Health Therapies in the Veterans Health  
Administration for Veterans with Chronic Pain

A dissertation submitted in partial satisfaction  
of the requirements for the degree  
Doctor of Philosophy in Health Policy and Management

by

Adam Harrison Resnick

2022

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## ABSTRACT OF THE DISSERTATION

Use and Adoption of Complementary and Integrative Health Therapies in the Veterans Health  
Administration for Veterans with Chronic Pain

by

Adam Harrison Resnick

Doctor of Philosophy in Health Policy and Management

University of California, Los Angeles, 2022

Professor Corrina Moucheraud, Co-Chair

Professor Emmeline Chuang, Co-Chair

Complementary and Integrative Health (CIH) approaches to medical care include trained medical providers working closely with patients to incorporate both alternative (e.g., acupuncture, yoga, meditation, etc.) and conventional medicine into standard medical care. While the effectiveness of CIH therapies is a well-studied topic, less is known about their use and adoption within large health care systems. As with other therapeutic modalities, use and adoption of CIH therapies is impacted by a myriad of interacting factors at the patient, provider, and organizational levels. This three-paper dissertation explored some of these factors through a service delivery and policy lens, with an aim to provide policy makers and other health systems with data on whether and how novel, non-pharmaceutical therapeutics are being integrated into the conventional health system. In Chapter 2 (Study 1), I used a longitudinal design to measure use of CIH therapies funded by the Department of Veterans Affairs (VA) for a defined cohort of Veterans over a three-year period. I compared the proportion of users in Flagship and non-Flagship VA medical centers (VAMCs) pre-and mid-implementation of a three-year pilot aimed at expanding provision of CIH therapies. Flagship VAMCs received

considerable financial and implementation support from central VA administration to assist with expanding availability and accessibility to CIH therapies and other Whole Health System services. Non-Flagship VAMCs were expected to also expand access to the eight mandated CIH therapies, but without the additional financial or technical support provided to Flagship VAMCs. From pre-implementation to two years post-implementation of the three-year pilot, the percent of users increased by an absolute value of 3.1% system-wide for this population (from 10.2% to 13.3%). Increases were observed for Veterans in both Flagship and non-Flagship VAMCs, but were significantly greater at Flagship VAMCs, particularly in the final study year. In Chapter 3 (Study 2), I used a cross-sectional design to examine organizational characteristics associated with use of VA-funded CIH therapies. VAMCs are required to provide access to eight CIH therapies for Veterans, but can choose whether to provide these services directly or via referral to community-based providers. Direct provision of CIH therapies within VAMCs is resource intensive, as it requires program development, hiring and training of staff, and system level changes that support incorporation into standard medical care. However, overreliance on VA-funded community care increases risk of care fragmentation and negatively impacts resources available for internal VAMC use. This study found that rurality, Flagship status, and receipt of targeted Whole Health System grants were not associated with provision of more VA-funded CIH therapies. I also found that VAMCs with fewer VA-based CIH therapies available provided as many or more total CIH visits on average as VAMCs with more VA-based CIH therapies, due to greater reliance on VA-funded community care. Chapter 4 (Study 3) was a qualitative study that assessed Veteran and provider knowledge and attitudes towards CIH therapies, as well as perceived barriers to CIH uptake. Data included interviews with 17 Veterans with chronic pain and opioid use disorder (OUD) and 45 providers from five VAMCs in the southwestern US. It found that Veterans and providers had good knowledge of CIH therapies as effective and important treatment options based on personal experience and recognition of need for multi-modal treatments that include NPIs, particularly for Veterans with

chronic pain. As a result, they were generally enthusiastic about integrating CIH therapies into treatment plans as an NPI option for chronic pain. However, providers had more mixed attitudes towards using CIH therapies for Veterans with OUD because they noted this population is more resistant to using CIH therapies and is more unstable. Veterans interviewed for this study did not express those fears and largely wanted access to these therapies. Providers also noted several system-level challenges impacting use of CIH therapies through the VA, including lack of availability, the absence of central directory showing availability of CIH therapies within VAMCs, and the bureaucratic community care referral system.

This dissertation of Adam Resnick is approved.

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## **ACKNOWLEDGEMENTS**

I am grateful to the many people who have supported me throughout the PhD program and dissertation process. I would like to thank Emmeline Chuang and Corrina Moucheraud for providing outstanding mentorship and guidance through every phase of the doctoral journey. I could not have asked for better advisors, and I will be forever grateful for having had the opportunity to learn so much from such talented people. To committee members David Ganz, Stephanie Taylor, and Becky Yano, thank you for always making time for me to answer questions and provide invaluable feedback for my dissertation and beyond. To Evelyn Chang and Steve Zeliadt, thank you for allowing me to use data from your VA projects. To my Mom and Dad for the encouraging me to go back to school and providing assistance to my family to help us be successful during a transition period. To Jeanne and Don Berges for providing support throughout our time in Los Angeles. To my children, Ben and Zach, for making my Doctoral experience rich and purposeful. And finally, to my wife, Jackie, I could not have done this without you. Thank you for taking this risk with me and helping me feel confident I could achieve my goals. I couldn't ask for a better partner.



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Yano EM, **Resnick A**, Gluck M, Kwon H, Mistry KB. Accelerating learning healthcare system development through embedded research: Career trajectories, training needs, and strategies for managing and supporting embedded researcher. *Healthcare*. 2020. 8 Supplement 1: Article 100479

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## **CHAPTER 1: Introduction**

### *Section 1. History of Alternative Medical Treatments*

Throughout the 19<sup>th</sup> century, a number of medical sects were vying for professional dominance in the United States (US).<sup>1,2</sup> Samuel Hahnemann, the founder of homeopathy, coined the phrase 'allopath' to differentiate homeopathic practitioners from what were considered conventional doctors at the time.<sup>3</sup> Whereas homeopaths and other alternative treatment practitioners generally treated illness using less invasive remedies, allopaths, according to Hahnemann, were more likely to treat illness using 'heroic' interventions such as blood-letting, vomiting, purging of the bowels, blistering of the skin, and other depletive measures.<sup>1,4</sup> By the 1850s, Americans had a number of alternatives to allopathic medicine to choose from, including homeopathy, botanical drugs, hydropathy (use of water as a treatment, such as steam baths), and magnetic healing (e.g., hypnosis and suggestion). Following the Civil War, a second generation of alternative treatments took root, including osteopathy in the 1870s, and chiropractic and naturopathy in the 1890s. In the 20<sup>th</sup> century, more alternative treatments became available in the US, most notably therapeutic massage and acupuncture.<sup>1,2</sup>

Inevitably, the rise and spread of alternative treatments led to clashes with the allopathic medical establishment. This resulted in political battles over licensing and funding for medical education and hospitals in states across the country. Ultimately, reliance on scientific methods, and in particular the establishment of germ theory in the early 20<sup>th</sup> century, helped allopathic medicine establish dominance politically and in the court of public opinion. Despite this, competition between what we now consider conventional medicine and a number of alternative medical sects persisted as the use of alternative treatments continued to rise throughout the 20<sup>th</sup> century.<sup>1</sup>

According to Terri Winnick, Professor of Sociology at Ohio State, the conventional medical profession responded to the growth of alternative treatments in three distinct phases in

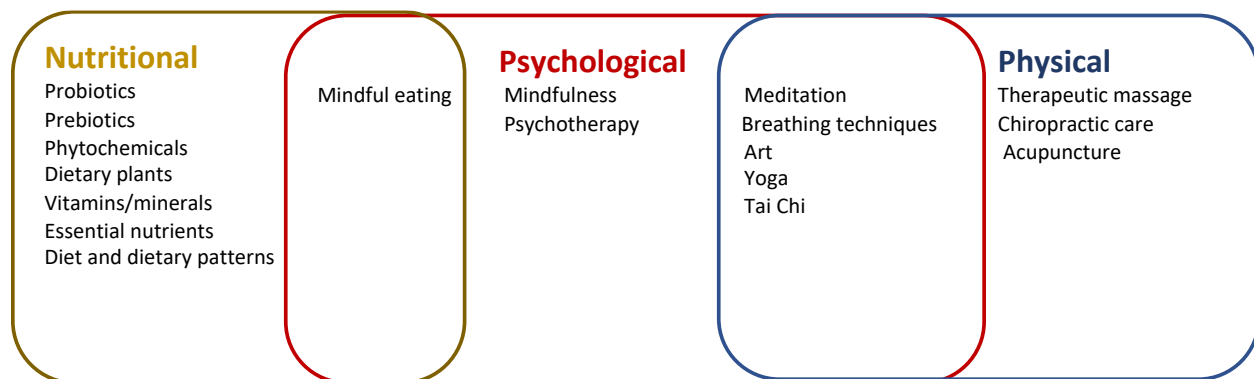
the second half of the 20<sup>th</sup> century.<sup>2</sup> In the condemnation phase, which lasted from the 1960s to early 1970s, conventional medicine ridiculed alternative treatments and exaggerated their risk. In the reassessment phase (mid-1970s through early 1990s), increased use of alternative treatments prompted concern that caused the medical profession to question shortcomings of conventional care. In the integration phase (1990s), the conventional medical profession began to reconsider the usefulness of alternative treatments.<sup>2</sup> This resulted in alternative treatments increasingly being used alongside conventional medical treatments and subjected to rigorous scientific scrutiny. The integration period culminated with the US Congress formally establishing the Office of Alternative Medicine in 1992 and the National Center for Complementary and Alternative Medicine (NCAM) in 1999, which was later renamed the National Center for Complementary and Integrative Health (NCCIH).<sup>5</sup> The NCCIH is one of 27 centers of the National Institutes of Health, and its primary mission is to subject alternative medical treatments to rigorous scientific investigation of their effectiveness and safety.

## *Section 2. Overview of Complementary and Integrative Health*

The terminology used to describe alternative medical treatments has evolved since the founding of NCCIH. Presently, use of alternative treatments in lieu of conventional medicine is referred to as “alternative medicine”.<sup>6</sup> In contrast, use of alternative treatments in conjunction with conventional medicine (but not actively coordinated by trained medical providers) is typically referred to as “complementary medicine”.<sup>7</sup> Finally, active coordination of alternative treatments with conventional medicine by trained medical providers is referred to as “integrative health”.<sup>6</sup> Therefore, according to NCCIH, a “complementary and integrative health” (CIH) approach includes trained medical providers working closely with patients to incorporate both alternative and conventional care into treatment plans.<sup>6</sup> For simplicity and in line with the vernacular often used in published research, this dissertation will use “CIH therapies” as the catch all to refer to these therapies for the remainder of the dissertation.

As can be seen in Figure 1, NCCIH categorizes available CIH therapies into three non-exclusive main categories: nutritional, physical, and psychological (in practice, CIH therapies are often used in conjunction with one another). Nutritional therapies include herbs, vitamins and minerals, and probiotics, and are typically sold as over-the-counter dietary supplements. Physical therapies include acupuncture, therapeutic massage, and chiropractic care, and are delivered by trained, licensed providers. Most psychological therapies are also categorized as physical approaches, and include yoga, meditation, Tai Chi, and relaxation exercises.

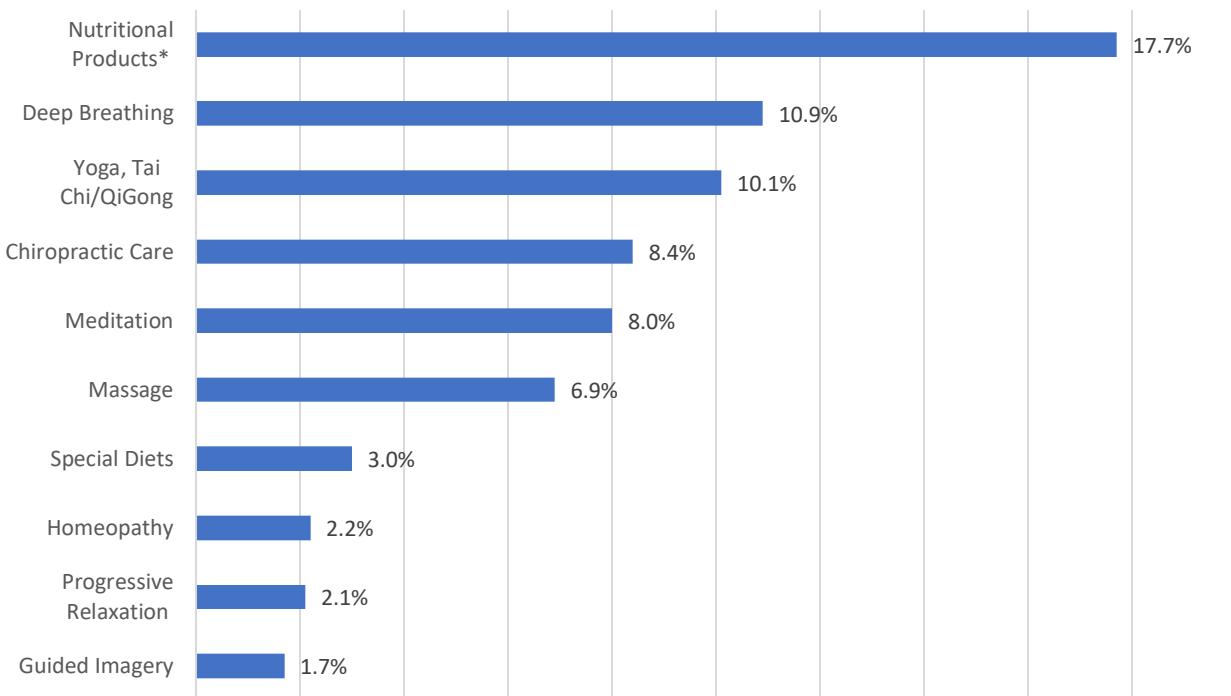
Figure 1. NCCIH Categorization of Main CIH Therapies<sup>6</sup> (Author Adaptation)



Use of CIH therapies by US adults has been tracked by the National Health Interview Survey (NHIS) for several years. In a 2015 study by Clarke et al. using data from the NHIS (Figure 2), it was found that nutritional products (defined as dietary supplements other than vitamins and minerals) were the most commonly used CIH therapies, with almost one in five US adults reporting use in 2012.<sup>8</sup> Deep breathing, yoga/Tai Chi/Qi Gong, chiropractic care, meditation, and therapeutic massage were the next most common therapies, and used by over 5% of US adults in 2012. While CIH therapies are used to treat a wide array of health conditions, back/neck pain and other musculoskeletal conditions are the most common reasons for use according to the 2012 NHIS survey.<sup>8</sup> In 2017, NHIS surveyed US adults about yoga and

meditation (and did not ask about other CIH therapies) and found an increase in use of these two therapies, reflecting growing interest in CIH therapies.<sup>9</sup>

Figure 2. Ten Most Commonly Used CIH Therapies Among Adults, 2012<sup>8</sup> (Author Adaptation of Graph from Clarke Study)



\*Other than vitamins and minerals

### Section 3. Scientific Evidence for CIH Therapies

Scientific scrutiny of CIH therapies accelerated with the founding of the NCCIH in the 1990s. Extant research evaluating the effectiveness and safety of CIH therapies suggests that, while there is little evidence that nutritional products are effective,<sup>6</sup> several physical and psychological CIH therapies are effective at treating several health conditions, including chronic pain, anxiety, depression, insomnia, irritable bowel syndrome, insomnia, and improving quality of life for people with chronic conditions.<sup>6</sup> Research supporting use of CIH therapies for chronic

pain is particularly strong.<sup>10,11,20,12-19</sup> For example, a 2016 systematic review conducted by NCCIH researchers to examine 105 US based randomized control trials over the past 50 years identified the following treatments as effective at helping patients manage certain painful conditions: acupuncture (back pain, osteoarthritis of the knee); therapeutic massage (neck pain, back pain); chiropractic care (back pain); relaxation techniques such as meditation and biofeedback (severe headaches and migraine, fibromyalgia); Tai Chi (fibromyalgia, osteoarthritis of the knee); and yoga (back pain).<sup>21</sup> As noted by the authors, these findings were largely in line with other systematic reviews that examined effectiveness of CIH therapies for pain.<sup>10-19</sup>

There are some limitations related to studying CIH therapies that should be noted. These include: difficulty in singling out the impacts of CIH therapies since they are often used in conjunction with each other and with conventional medicine; the quality of care provided for CIH therapies varies considerably depending on the practitioner providing care (e.g., the expertise of acupuncturists may vary substantially); research studies of CIH therapies often enroll non-diverse populations; and the benefits of CIH therapies may accumulate over a long period of time, often beyond what can be feasibly studied.<sup>21,22</sup> Due to these limitations and because nuanced research on effectiveness (e.g., dose effects) is still relatively nascent, there is still much to learn about how use of CIH therapies impact health, particularly over the long-term.

#### *Section 4. Overview of Veterans Health Administration and Efforts to Integrate CIH Therapies*

The Veterans Health Administration (VA) is the largest integrated health care system in the US. It has 1,293 health care facilities, which include 171 VA Medical Centers (VAMC) and 1,112 outpatient sites, and over nine million Veteran enrollees.<sup>23</sup> Veterans seeking care at the VA have unique medical needs compared to the general population. In particular, chronic pain among this population is very high: up to 50% of male veterans and 78% of female veterans presenting to VA primary care settings reporting some kind of chronic pain.<sup>24-26</sup> Owing to medical advancements, Veterans are now more likely to survive serious injuries or wounds but

may go on to live with substantial pain.<sup>27-30</sup> Additionally, pain in Veterans tends to co-occur with high rates of psychiatric and social problems, such as substance abuse.<sup>26</sup>

As an innovative health care system that has consistently been a leader at implementing medical reforms, the VA has been at the forefront of offering CIH therapies to patients. The VA initially began offering CIH therapies in VAMCs in late 1990s. However, care was not centrally coordinated and was instead driven by Veteran demand and provider interest.<sup>31</sup> This led to CIH therapies being inconsistently and narrowly available. In the last ten years, the VA began to prioritize centralizing and standardizing offerings of CIH therapies within all VAMCs and undertook organizational changes aimed to significantly increase availability, adoption, and use of CIH therapies across the VA, particularly for Veterans with chronic pain. First, in 2014 the VA created the Integrative Health Coordinating Center within the Office of Patient Centered Care and Cultural Transformation, with an aim of the improving access to and implementation of CIH therapies across the VA.<sup>31,32</sup> Second, in May of 2017, the VA Under Secretary for Health approved Directive 1137: Provision of Complementary and Integrative Health.<sup>33</sup> The directive mandates that eight evidence-based CIH therapies be incorporated into the standard VA medical benefits package: acupuncture, biofeedback, clinical hypnosis, guided imagery, therapeutic massage, meditation, Tai Chi/Qigong, and yoga. Third, in response to the Comprehensive Addiction and Recovery Act - federal legislation signed into law in 2016 - the VA began a three-year pilot in 2018 to expand provision of CIH therapies system-wide, with considerable resources devoted to expansion in eighteen “Flagship” VAMCs.<sup>31</sup>

### *Section 5. Overview of Dissertation*

This dissertation examined the use of CIH therapies (among Veterans with chronic pain) and adoption (within VAMCs) during a time the VA was investing substantially in increasing their provision as part of standard medical care. The analyses focused on Veterans with chronic pain because evidence of effectiveness of CIH therapies for chronic pain is robust, a large



percentage of Veterans have chronic pain, and the VA is strategically targeting this population for use.

While the effectiveness of CIH therapies is a well-studied topic, less is known about CIH uptake within large health care systems. As with other therapeutic modalities, use and adoption of CIH therapies is impacted by a myriad of interacting factors at the patient, provider, and organizational levels.<sup>34</sup> This dissertation explores some of these factors through a service delivery and policy lens, with an aim to provide policy makers and other health systems with data on novel, non-pharmaceutical therapeutics increasingly being integrated into the conventional health system. Although some research exists on the use CIH therapies within the VA for Veterans with chronic pain<sup>35-38</sup>, results have varied depending on the data source and method, and receipt of VA-funded CIH therapies through community-based providers was not reliably captured (i.e., non-VA providers contracted with the VA to administer healthcare services outside of the VA to Veterans). This dissertation's use of national data using validated methods (developed by the VA 'QUERI Complementary and Integrative Health Evaluation Center; PI: Taylor, Zeliadt) to capture Veteran use of ten CIH therapies through the VA (VA and community-based) makes it distinct from prior research on similar topics.

### *Overview of studies*

Below is a summary of the three empirical studies conducted to examine use and adoption of CIH therapies within the VA.

**Study 1.** This study used a longitudinal design to measure rates of CIH therapy use for a defined cohort of Veterans over a three-year period. It compares the proportion of users in Flagship and non-Flagship VAMCs pre-and mid-implementation of a three-year pilot aimed at expanding provision of CIH therapies. Flagship VAMCs received considerable financial and implementation support from central VA administration to assist with expanding availability and

accessibility to CIH therapies and other Whole Health System services. Non-Flagship VAMCs were expected to also expand access to the eight mandated CIH therapies, but without the additional financial or technical support provided to Flagship VAMCs.

This study had two primary aims:

1. Create a profile of Veterans with chronic musculoskeletal pain who are users of CIH therapies through the VA.
2. Assess changes in CIH therapy users overall and at Flagship and non-Flagship VAMCs pre- and mid-implementation of the three-year pilot for a defined cohort of Veterans with chronic musculoskeletal pain.

**Study 2.** This study used a cross-sectional design to examine organizational characteristics associated with adoption of CIH therapies within VAMCs. Under Directive 1137, VAMCs are required to provide access to eight CIH therapies for Veterans, but can choose whether to provide these services directly or via referral to community-based providers. Direct provision of CIH therapies by VAMCs is resource intensive, as it requires program development, hiring and training of staff, and system level changes that support incorporation into standard medical care. Referral to community-based providers (i.e., community care) can expand access to CIH therapies for Veterans that live far from a VAMC or have limited options available at their VAMC. However, overreliance on VA-funded community care may increase risk of care fragmentation and reduces funds available for internal VAMC use.

This study had two primary aims:

1. Describe VAMC-level variation related to the provision of VA- or community-based CIH therapy visits for Veterans with chronic musculoskeletal pain.
2. Identify organizational characteristics associated with use of VA-based CIH therapies by Veterans with chronic musculoskeletal pain.

**Study 3.** This qualitative study complements studies 1 and 2 by providing contextual data on factors impacting use of CIH therapies for a targeted and complex subpopulation, Veterans with chronic pain and opioid use disorder (OUD). Specifically, this study investigated system-, provider-, and patient-level factors impacting use of CIH therapies in the VA among Veterans with OUD. Factors of specific interest included knowledge and attitudes of providers and Veterans towards using CIH therapies for OUD treatment and the system context in which services are accessed. Data included interviews with 17 Veterans with chronic pain and opioid use disorder (OUD) and 45 providers from five VAMCs in the southwestern US.

This study had three primary aims:

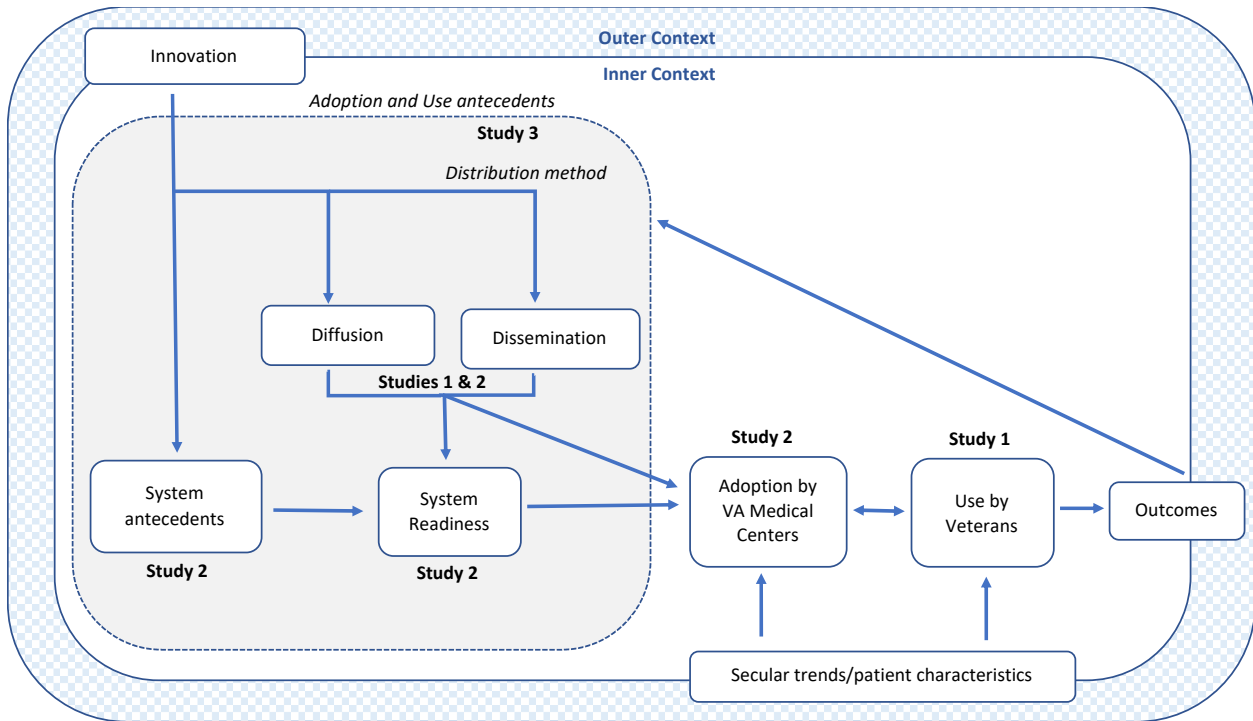
1. Describe Veteran knowledge and attitudes related to using CIH therapies for Veterans diagnosed with OUD.
2. Describe knowledge and attitudes of VA providers related to incorporating CIH therapies into treatment for Veterans diagnosed with OUD.
3. Describe the system context in which Veterans with OUD and providers access and use CIH therapies.

### *Conceptual model*

The research aims and analyses in this dissertation were guided by a theoretically-informed conceptual model (Figure 3). This conceptual model draws on factors affecting innovation implementation in healthcare, and is informed by constructs from Greenhalgh's theoretical model of dissemination and implementation of healthcare innovations,<sup>39</sup> which itself adapts Rogers's Diffusion of Innovation framework.<sup>40</sup> Briefly, the Greenhalgh model synthesizes prior research on how innovations spread within populations and health care organizations,<sup>40</sup> and describes implementation as affected by a wide range of factors<sup>41</sup> A list of constructs hypothesized to influence use adoption of CIH therapies and a description of how they are being conceptualized is provided in Table 1 below. Greenhalgh's model was chosen as a guide

because it provides a validated and robust framework for understanding the process by which novel health care therapies spread throughout a health care system.

Figure 3. Conceptual Model of Factors Impacting Use and Adoption of CIH therapies for Veterans within the VA



Note: Adapted from Greenhalgh's theoretical model of dissemination and implementation of healthcare innovations<sup>39</sup>

Table 1. Overview of Conceptual Model Constructs Informing Dissertation

<b>Constructs</b>	<b>Description</b>
<b>Innovation</b>	CIH therapies can be conceptualized as an innovation in the context of systematically integrating into standard medical care within a large integrated health system, which is novel.
<b>Context</b>	<i>Outer context:</i> Secular trends in use and acceptability of CIH therapies. Policies outside the VA that may impact use (e.g., insurers paying for CIH therapies) and adoption (e.g., insurers and of CIH therapies).  <i>Inner context:</i> Internal VA policies and programs, such as the Whole Health System initiative.
<b>Adoption and Use antecedents</b>	<i>Distribution:</i> Dissemination (active efforts to spread CIH therapies to VAMCs) and diffusion (passive, effortless spread of CIH therapies to VAMCs).  <i>System antecedents:</i> Structure, size and location of VAMCs  <i>System readiness:</i> Dedicated time/resources, monitoring and feedback
<b>Adoption (outcome of interest)</b>	Adoption of CIH therapies within VAMCs (availability, composition of services offered, access, buy-in from providers and leaders)
<b>Use (outcome of interest)</b>	Use of CIH therapies by Veterans with chronic pain
<b>Outcomes</b>	Improved quality of care. Better population health. Reduced costs. Improved well-being of patients. More tools for providers to offer to Veterans.

### Section 6. Policy Significance

This dissertation aims to provide policy makers, the VA, and other large health systems with data on use and adoption of CIH therapies within one of the largest integrated health systems in the United States. Using a diffusion of innovation framework to understand system-level factors impacting adoption at patient, provider, and organizational levels, these findings can help organizational leaders and policy makers set realistic expectations around use and adoption of CIH therapies within a conventional healthcare system. This includes understanding

how much these therapies may be used by patients and the amount of time and effort it might take to observe meaningful changes in use and population health metrics. While data are limited to the VA, the data should be relevant to other health systems who may be considering systematic integration of CIH therapies into standard care. Findings may also provide insight factors impacting use of CIH therapies within highly targeted and complex subpopulations, such as those with OUD. This information can be used to tailor strategies aimed at increasing use of CIH therapies specifically towards certain targeted subpopulations. For the VA, findings provide data on the impact of recent organizational initiatives on use of CIH therapies. In particular, this work assesses the impact of dedicated resources and active dissemination provided to Flagship VAMCs on CIH therapy utilization. For the VA, health systems, and policy makers, this dissertation highlights the need for more research to understand factors impacting use of CIH therapies within a large integrative health system.

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## **CHAPTER 2: Changes in CIH Therapy User Rates Among Veterans with Chronic Musculoskeletal Pain at the Department of Veterans Affairs: Early Findings From a Three-Year Whole Health Pilot**

### **Introduction**

The VA began offering CIH therapies in VAMCs in the late 1990s. Initially, demand from Veterans and providers, not VA central leadership, drove availability.<sup>1</sup> As a result, the services offered were often inconsistent, small in scope, and not well integrated with conventional medical care.<sup>1</sup> Since then, demand from Veterans has increased and scientific evidence supporting use of several CIH therapies to help treat chronic pain has become more robust.<sup>2,3</sup>

To provide up-to-date evidence-based medicine to Veterans with chronic pain and other complex medical needs, the VA implemented major organizational reforms that aimed to expand access to CIH therapies and integrate them into standard medical care. In 2016, the VA updated their Clinical Practice Guidelines to include offering CIH therapies for treatment and management of chronic pain.<sup>4</sup> In 2017, the Under Secretary for Health approved ‘Directive 1137: Provision of Complementary and Integrative Health’, which mandated that eight evidence-based CIH therapies be incorporated into the standard VA medical benefits package.<sup>6</sup> In 2018, the VA also launched a three-year pilot to expand availability and provision of CIH therapies in VAMCs. The pilot, which was conceptualized as the first wave of national deployment of a new, Whole Health System model of care,<sup>1</sup> aims to improve patient-centered care within the VA by integrating Veteran goal and mission driven personal health planning with allopathic and non-allopathic care.<sup>7</sup>

Under the Whole Health System initiative, 18 “Flagship” VAMCs were selected to receive substantive financial funding and technical support from the VA Office of Patient Centered Care and Cultural Transformation to assist with expansion and implementation of CIH therapies and other Whole Health System activities. Flagship VAMCs included one medical

center from each of the 18 regionally-based Veterans Integrated Service Networks (VISNs). VISN directors purposefully selected these Flagship VAMCs using criteria outlined in the 2016 Comprehensive Addiction and Addiction Recovery Act legislation passed by Congress (i.e., sites that provide polytrauma care, sites with high opioid prescribing rates, and facilities with some experience with Whole Health System activities).<sup>1,7</sup> The remaining VAMCs (non-Flagship sites) did not receive major funding or extra support, but were expected to expand access to the eight evidence-based CIH therapies.<sup>1,8-10</sup>

According to Greenhalgh's Diffusion of Innovation in Service Organizations<sup>11</sup> and Roger's Diffusion of Innovation<sup>12</sup> theories, Flagship VAMCs receiving dedicated resources and more active dissemination from the VA central office should experience substantively greater gains in users of CIH therapies compared to non-Flagship VAMCs. This is because expanding access to CIH therapies and incorporating them into standard care within VAMCs is resource intensive, as it requires program development, hiring and training of staff, and initiating and sustaining structural changes to service delivery for providers and Veterans. These theories would also suggest the gains increase over times, as it takes time for large-scale system changes to occur. Using national data (developed by the VA Complementary and Integrative Health Evaluation Center; PIs: Taylor, Zeliadt) to capture Veteran use of CIH therapies through the VA, this study assesses changes in the rates of users of CIH therapies for a defined cohort of Veterans with chronic musculoskeletal pain pre-and mid-implementation of the three-year Whole Health System pilot. It has two aims:

**Aim 1:** Create a profile of Veterans with chronic musculoskeletal pain who are users of CIH therapies through the VA. Specifically, this study measures measure: 1) the percent of Veterans with chronic musculoskeletal pain using ten CIH therapies (eight mandated therapies plus chiropractic care and battlefield acupuncture) and; 2) demographic and clinical characteristics of CIH therapy users. Most prior research on use of CIH therapies in the VA

among Veterans with chronic pain has produced results that vary depending on the data source and method, and also did not reliably capture receipt of VA-funded community care for CIH (i.e., care provided by non-VA providers contracted with the VA to administer healthcare services to Veterans).<sup>13,14</sup>

**Aim 2:** Assess changes in CIH therapy user rates overall and at Flagship and non-Flagship VAMCs pre- and mid-implementation of the three-year Whole Health System pilot for a defined cohort of Veterans with chronic musculoskeletal pain.

Results from this study will provide real-world, population level data on users of CIH therapies in the context of a large-scale, systematic implementation in one of the largest integrated health care systems in the United States.

## **Methods**

### Data source

Primary data for this study are from the VA Complementary and Integrative Health Evaluation Center; PI: Taylor (PI: Taylor, Zeliadt) Data Nexus project database. This database contains patient-level data on VA- and community-based CIH utilization of ten CIH therapies (the eight mandated therapies plus chiropractic care and Battlefield Acupuncture, which the VA is also collecting data for), and select demographic and clinical characteristics for Veterans from fiscal year (FY) 2017-2019 (FY for the VA is October 1<sup>st</sup> - September 30<sup>th</sup>). While not mandated by Directive 1137, chiropractic care (which is evidence-based) and Battlefield Acupuncture (the evidence supporting use is currently limited) are two of the most commonly used CIH therapies within the VA<sup>15</sup> and therefore were included in this study. CIHEC's Data Nexus database was developed in collaboration with and funding from the VA Office of Patient Centered Care and Cultural Transformation.

The VA Complementary and Integrative Health Evaluation Center developed a robust methodology to identify CIH therapy utilization for Veterans from the VA's Corporate Data

Warehouse, a relational database containing demographic, clinical, enrollment, and treatment utilization for Veterans using care at the VA. Visits within VAMCs were identified by searching CPT codes, location names, note titles, CHAR4 codes (designated by Managerial Cost Accounting Staff to define and track the type of service being offered in a specific clinic.<sup>16</sup>), and stop codes (used to identify a clinic that delivers a specific type of clinical care<sup>16</sup>) using search criteria developed by the Whole Health System evaluation team with input from VA subject matter experts.<sup>15</sup> Visits include both in-person and telehealth visits with a VA provider. VA-funded community care CIH therapy visits were captured from the Program Integrity Tool database within the Corporate Data Warehouse, which contains VA Office of Community Care claims data for services provided in the community.<sup>17</sup> The method used to extract claims data was developed by the VA's Health Economics Resource Center.<sup>18</sup>

Data for VA system complexity (FY17 designation), a composite variable that classifies the complexity of individual VAMCs, came from VA Support Service Center. The support service center contains a dashboard containing select utilization and organizational data available to internal VA researchers. Data for drive time to nearest primary VA medical center came from the Planning Systems Support Group, which uses geo-coding to estimate travel distances and times to the nearest VA facility. Data indicating if VAMCs received small grants (not related to the three-year pilot) to implement Whole Health System activities from 2014-2018 came from the VA Office of Patient Centered Care and Cultural Transformation.

### Research Design and Study Sample

This study uses a longitudinal quasi-experimental design. It measures changes in the percent of CIH therapy users within Flagship and non-Flagship VAMCs from FY 2017-2019 among a defined cohort of Veterans. The sample was restricted to Veterans enrolled in the VA who were diagnosed with chronic musculoskeletal pain in FY17 and had at least one primary care or mental health care visit in FY17, FY18, and FY19 (i.e., they receive at least some care

from the VA in all 3 study years). Veterans diagnosed with chronic musculoskeletal pain in FY17 were chosen as the population of interest because: 1) they are highly targeted by efforts to expand access to CIH therapies; and 2) this cohort was diagnosed with chronic musculoskeletal pain by a VA provider prior to implementation, thus making them targets for CIH therapies at the outset of the three-year pilot. A Veteran was considered to have chronic musculoskeletal pain in FY17 if they had a musculoskeletal pain diagnosis or had at least two Numeric Rating Scale scores  $\geq 4$  separated by at least thirty days in the year prior to their index visit (i.e., the first primary care or mental health visit in FY17). For the Numeric Rating Scale, patients are asked to circle the number between 0 and 10 that fits best to their pain intensity. Zero represents 'no pain at all' and the upper limit represents 'the worst pain ever possible'.<sup>19</sup> This definition of chronic musculoskeletal pain was developed by the Pain Management Collaboratory, which is comprised of eleven clinical trials studying nonpharmacological approaches for the management of pain in Military and Veterans healthcare systems.<sup>20</sup> Only Veterans assigned to the same VA medical center in all three study years were included in the final sample to control for potential site-level differences related to use of CIH therapies. The unit of analysis for the study is the veteran/FY dyad.

## Variables

### *Dependent Variable*

The dependent variable is use of a CIH therapy through the VA (VA-based and VA-funded community care). This variable is binary (yes/no) and captures if a Veteran used any of the ten CIH therapies of interest within a FY (i.e., any versus no use).

### *Explanatory Variable*

The primary independent variable of interest is the interaction between FY and Flagship status. Flagship status is a binary variable that indicates if the Veteran's assigned VA medical



center (based on where their FY 2017 index visit was) participated as a Flagship site (0=no, 1 = yes). FY includes FY2017, FY2018, and FY2019 for each Veteran.

### *Control Variables*

Demographic and clinical characteristics of Veterans in the study sample are also included in the analysis. Demographics include age, sex, race, ethnicity, urban/rural residence, and drive time to nearest primary VA. Age was converted from a continuous variable to a categorical variable with 5 levels (18-39, 40-49, 50-59, 60-69, 70+) to improve interpretability. Due to small numbers of non-Black and non-White Veterans, as well as inherent problems of capturing race information in administrative data, race was grouped into 4 categories: White, Black, other, and unknown. Ethnicity was grouped into three categories: Hispanic, not Hispanic, and unknown. Urban/rural residence of the veteran is a binary variable based on the recorded residence of the patient's address. Using a Veterans documented address, the VA uses the Rural-Urban Commuting Areas system to define rurality, which takes into account population density as well as how closely a community is linked socio-economically to larger urban centers.<sup>21</sup> Drive time to the nearest primary VA (minutes) was converted from a continuous variable to a categorical variable with six categories (0-10, 11-20, 21-30, 31-40, 41-60, >60) to improve interpretability. These demographic variables were included because they are known to impact CIH therapy use (e.g., younger Veterans use at a higher rate) or are hypothesized to impact CIH therapy use (e.g., Veterans living farther away from the VA may be less likely to use CIH therapies within VAMCs; cultural differences may impact use in rural areas).<sup>15</sup>

Clinical characteristic variables of Veterans were also included. They include flags for diagnoses of the following conditions in the year prior to a Veteran's index visit for each FY: anxiety, depression, post-traumatic stress disorder, cardiovascular disease, and obesity. These variables were included in the analysis because CIH therapy use varies by disease type.<sup>15,22</sup>

System complexity, a composite organizational variable indicating the level of clinical complexity of the VAMC (1a, 1b, 1c, 2, or 3) was also included in the analysis.<sup>23</sup> The VA determines facility complexity based upon a formula that considers the patient population, the patient risk, the level of intensive care unit and complex clinical programs. In the VA, more complex systems are more likely to be affiliated with academic medical centers and have other resources to draw upon that may make them more cosmopolitan and more able to effectively expand access to CIH therapies.

### Statistical Analysis

Descriptive statistics, stratified by Flagship status, were calculated to describe use of CIH therapies among Veterans with chronic musculoskeletal pain and also identify demographic and clinical characteristics of users. A population-average logit model was conducted to measure changes in users of any CIH therapies over time, controlling for select patient and organizational factors. The model controlled for patient characteristics because demand for CIH therapies may differ depending on patient mix (e.g., there may be more demand for CIH therapies at VAMCs with a greater proportion of chronic pain patients). This model controlled for clustering at the person and VAMC level because time was nested in Veterans were (e.g., repeated measures of Veterans over time) and time and Veterans were nested within VAMCs. The model included an interaction term for FY and Flagship status to test the effect of interest (effect of Flagship status over time).

Two sensitivity analyses were conducted using mixed effects logistic models. One analysis included a random intercept for only personal identifier (scrambled SSN). The other included two random intercepts (one for patient identifier and one for facility identifier) and was conducted on a random sample of 100,000 patients because the model would not run on the full sample. While both random effects models produced results similar to the population average logit model in terms of the effect of the interaction term, these models were determined to be

poor fits because the inclusion of the random effects greatly understated the baseline predicted probabilities.

SQL software was used to extract data from the CDW. Data were analyzed in Stata 15.1.

## Results

The final sample included 874,499 Veterans. Figure 1 is a diagram showing how the sample was constructed.

Table 1 shows characteristics of the VAMCs overall and by Flagship Status. Flagship VAMCs are higher complexity, more urban, have more patients, and had more CIH programs available at the beginning of the three-year pilot.

Before implementation (FY17), approximately 17% (n=148,483) of the sample was assigned to a Flagship VAMC compared to 83% (n=725,916) assigned to a non-Flagship VAMC (Table 2). In total, 10.2% of Veterans with chronic musculoskeletal pain used a CIH therapy in FY17 (9.7% in Flagship and 10.3% in non-Flagship sites, respectively). Of the ten CIH therapies included in this study, chiropractic care (5.2%), acupuncture (4.5%), and massage therapy (4.5%) had the most users. Fewer than 1% of Veterans with chronic musculoskeletal pain used mind-body CIH therapies such as yoga, meditation, and Tai Chi/Qigong.

Table 3 is a descriptive table showing use of any CIH therapy by demographics, clinical characteristics, and Flagship status in FY17. Among the sample, female Veterans (15.5%) and Veterans ages 18-39 (16.4%) were the most likely to be CIH therapy users of all the demographic and clinical characteristics included in this study. Veterans with chronic physical conditions were more likely to be users compared to those with mental health conditions. The percent of CIH therapy users was also slightly higher among Veterans living closer to a primary VAMC (e.g., 12.5% for Veterans 10-20 minutes away compared to 9.3% living 60+ minutes away). The percent of the sample using CIH therapies by demographic and clinical

characteristics was similar in Flagship and non-Flagship VAMCs. In addition, as shown in Table 4, at baseline Flagship and non-Flagship VAMCs had similar patient populations (demographic and clinical characteristics included in this study).

Figure 2 shows the observed (unadjusted) changes in users of CIH therapies over the three-year pilot in Flagship and non-Flagship VAMCs. For all Veterans in the sample, percent of users increase from 10.2% to 13.3%. In Flagship VAMCs, the percent of users increased from 9.7% in FY 2017 to 14.2% in FY 2019, a relative increase of 46%. In comparison, the percent of CIH therapy users in non-Flagship VAMCs increased from 10.3% in FY2017 to 12.0% in FY2019, a relative increase of only 16.5%. Increased CIH therapy users in Flagship VAMCs was particularly evident in the final study year (year 2 of the implementation).

The population average logit model, which controlled for select demographic, clinical and organizational characteristics, produced results similar to the unadjusted results (Figure 3 and Figure 4). The predicted percent of CIH therapy users at Flagship VAMCs increased 52% from FY2017 to FY2019, from 9.9% to 15.0%. In comparison, the predicted percent of users in non-Flagship VAMCs increased 20% over this period, from 10.0% to 12.0%. The differences in predicted probabilities between Flagship and Non-Flagship VAMCs were statistically significant for both FY18 and FY19. As in the non-adjusted results, increase in users in Flagship VAMCs over non-Flagship VAMCs was much stronger in the final study year.

Both sensitivity analyses (mixed effects logistic models with one and two random effects) showed that changes over time in predicted probabilities of CIH therapy users were similar to population average logit model (despite the baseline predicted probability being much lower).

## **Discussion**

This study examined users of CIH therapies among a defined, targeted cohort of Veterans with chronic musculoskeletal pain over a three-year period in which the VA was systematically attempting to expand use and provision. Results show that approximately one in

ten Veterans with chronic musculoskeletal pain used a CIH therapy in FY17, the year prior to the three-year pilot. Of the CIH therapies included in this study, chiropractic care, acupuncture, and therapeutic massage had the most users. Fewer than 1% of Veterans with chronic musculoskeletal pain were users of mind-body CIH therapies such as yoga, meditation, and tai chi. From pre-implementation to two years post-implementation of the three-year pilot, the percent of users increased approximately 30% system-wide for this population. Increases were observed for Veterans in both Flagship and non-Flagship VAMCs, but increases were significantly greater at Flagship VAMCs.

Although user rates remained relatively low overall throughout the study period, the changes from pre-implementation to two years into the implementation represent significant progress in increasing CIH uptake. Considering the size of the VA (over 9 million enrollees), even small increases in user rates translates to tens of thousands more users of CIH therapies through the VA. Additionally, the VA is an extremely large, decentralized system with limited resources and a multitude of competing priorities. As a result, transforming care within the system is expected to be a slow, arduous process. Within the VA, space is limited to offer CIH therapies, and renovations operate on a five to twenty-year horizon. Hiring is also difficult and may take a long period of time. It can also take years to change ingrained therapeutic approaches of providers within the VA. Fortunately, findings from this study show that transformation towards care that incorporates more CIH therapy care is happening, particularly in Flagship VAMCs. While it may take several more years of sustained investment for the VA to realize their vision of a Whole Health System model of care, early results are promising.

Another key finding from this study is that Flagship VAMCs saw modestly superior gains in users compared to non-Flagship VAMCs. These gains were particularly pronounced in year two of the three-year pilot implementation. Although causality was not assessed, findings from this study strongly suggest that the resources committed to Flagship VAMCs were at least somewhat effective at helping them build infrastructure that accommodates more users. The VA

might look to leverage the knowledge and experience of the Flagship VAMCs as a strategy to improve user rates in non-Flagship VAMCs.

Future research might focus on disparities of CIH therapy users and usage at Flagship and non-Flagship VAMCs, as these differences may continue and perhaps accelerate in the future. Other future research may also address the extent to which other organizational factors known to impact implementation, such as leadership support, may also influence changes in CIH therapy users in the VA and other health systems.<sup>24</sup> Elucidating additional organizational factors impacting use of CIH therapies through VA could inform future improvement efforts. Finally, future research could assess the extent to which increased users and use of CIH therapies within VAMCs and other health systems influences population health and cost of care.<sup>25</sup> Last, the VA should continue to study changes in user rates over the next 5-10 years to determine the extent to which progress is sustained.

### *Strengths and Limitations*

The strengths of this study include the large sample size, robust methodology to capture CIH therapy utilization within the VA and community, and ability to track the same cohort over time. There are a few limitations that should be noted. First, this study could not comprehensively assess organizational factors other than Flagship status and system complexity that might influence CIH therapy use over time. Second, because Flagship VAMCs were chosen purposefully and not chosen randomly, and therefore Flagship VAMCs might be systematically different than non-Flagship VAMCs. As a result, the Flagship effect is only observation and may be due to other unobserved organizational factors such as leadership and buy-in. Third, because VA-based CIH therapy data were captured from administrative records, it is possible that some of the increase in use is due to improved coding, which may systematically favor Flagship VAMCs (due to receiving more technical guidance). Fourth, this study only measured use of CIH therapies as binary outcome and did not consider volume of

services. As a result, the user in this study is defined liberally and does not capture how much or consistently CIH therapies were used, which are important components of effectiveness. Last, the VA has many large community-based outpatient clinics located separate from a VAMC. For this study, these clinics were assigned to a VAMC based on geographical proximity. The system complexity measure only captures the complexity of VAMCs.

## **Conclusion**

This study provides real-world, population level data on users of ten CIH therapies over time in the context of a systematic implementation in a large integrated health care system. It finds that while user rates are relatively low (<15%) in a highly targeted population, modest but meaningful gains were achieved system-wide over a three-year period. Findings also show that dedicated resources and active dissemination provided to Flagship VAMCs receiving were at least somewhat effective at increasing user rates relative to non-Flagship VAMCs.

**CHAPTER 2:** Appendix

Table 1. Characteristics of VAMCs by Flagship Status, FY 2017

Figure 1. Sample Selection Diagram

Table 2. % of Veterans with Chronic Musculoskeletal Pain That were Users of CIH Therapies by CIH Therapy and Flagship Status, FY2017

Table 3. % of Veterans with Chronic Musculoskeletal Pain That were Users of at Least One CIH Therapy by Demographics, Selected Clinical Characteristics, and Flagship Status, FY 2017

Table 4. Demographic and Clinical Characteristics of Veterans with Chronic Musculoskeletal Pain by Flagship Status, FY17

Figure 2. Observed Changes in the % of Users of Any CIH Therapy Stratified by Flagship Status, FY 2017-2019

Figure 3. Changes in Predicted Probabilities of Being a CIH Therapy User Stratified by Flagship Status, FY 2017-FY2019

Table 5. Coefficient Table for Population Average Logit Model



Figure 1. Sample Selection Diagram

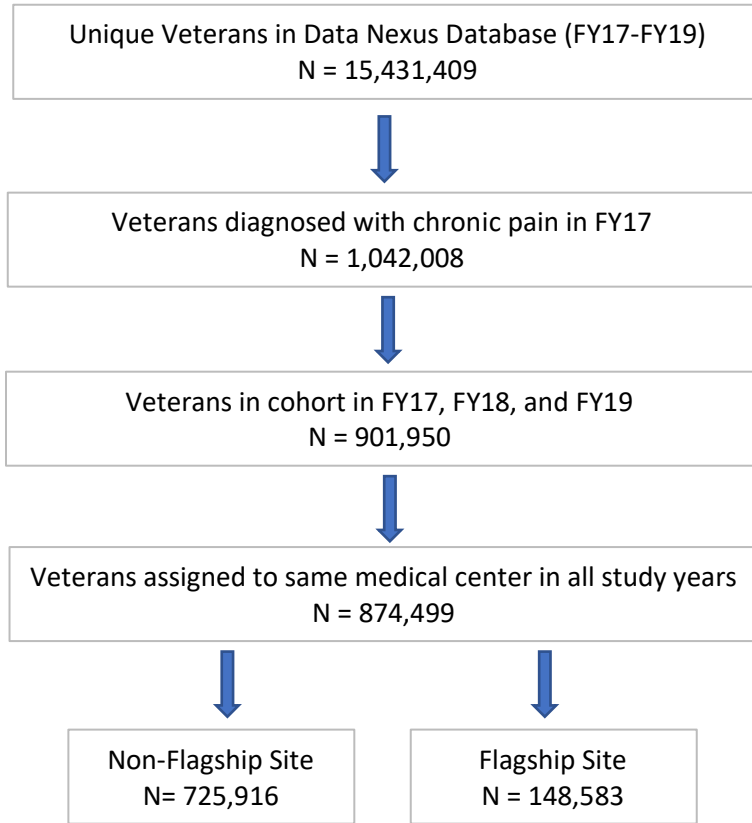


Table 1. Characteristics of VAMCs by Flagship Status, FY 2017

<b>Characteristic</b>	<b>All VAMCs (N=126)</b>	<b>Flagship VAMCs (N=18)</b>	<b>Non-Flagship VAMCs (N=108)</b>
<i>System Characteristics</i>			
System complexity			
1a - High complexity	31%	56%	27%
1b - High complexity	16%	11%	17%
1c - High complexity	15%	11%	16%
2 - Medium complexity	13%	6%	15%
3 - Low complexity	23%	17%	24%
Unknown	1%	0%	2%
% Rural VAMCs	12%%	6%	13%
% of VAMCs receiving targeted Whole Health grants from FY 2014-2018	39%	11%	44%

# of core CIH programs in VAMCs in 2017-2018			
0-2	13%	11%	13%
3-4	21%	11%	23%
5-6	22%	33%	20%
7-9	21%	39%	19%
Unknown	22%	6%	25%
<i>Veteran Characteristics of VAMCs</i>			
Average # of Veterans	40,876	51,233	38,054
% diagnosed with chronic musculoskeletal pain	21%	20%	20%
% with select chronic conditions*	72%	72%	72%
% with select mental health conditions**	31%	32%	29%
Average Veteran age	63	63	63

\*Includes a diagnosis of diabetes, obesity, COPD, or CVD

\*\*Includes a diagnosis of depression, anxiety, or PTSD in the study period

Table 2. % of Veterans with Chronic Musculoskeletal Pain That were Users of CIH Therapies by CIH Therapy and Flagship Status, FY2017

	<u>Overall (N=874,499)</u>		<u>Flagship (N=148,583)</u>		<u>Non-Flagship (725,916)</u>	
<i>CIH Therapy</i>	<i># of Patients</i>	<i>%</i>	<i># of Patients</i>	<i>%</i>	<i># of Patients</i>	<i>%</i>
<b>Any CIH</b>	<b>89,050</b>	<b>10.2%</b>	<b>14,351</b>	<b>9.7%</b>	<b>74,699</b>	<b>10.3%</b>
Chiropractic	45,360	5.2%	7,586	5.1%	37,774	5.2%
Acupuncture - Trad	39,591	4.5%	5,967	4.0%	33,624	4.6%
Massage	10,967	1.3%	1,753	1.2%	9,214	1.3%
Acupuncture - BFA	5,257	0.6%	732	0.5%	4,525	0.6%
Yoga	2,781	0.3%	657	0.4%	2,124	0.3%
Meditation	2,133	0.2%	604	0.4%	1,529	0.2%
Biofeedback	1,592	0.2%	264	0.2%	1,328	0.2%
Tai Chi/Qigong	1,265	0.1%	199	0.1%	1,066	0.1%
Hypnosis	354	0.0%	135	0.1%	219	0.0%
Guided Imagery	151	0.0%	6	0.0%	145	0.0%

Table 3. % of Veterans with Chronic Musculoskeletal Pain That were Users of at Least One CIH Therapy by Demographics, Selected Clinical Characteristics, and Flagship Status, FY 2017

Characteristic	Overall (N=874,499)	Flagship (n=148,583)	Non-Flagship (N=725,916)
<i>Demographics</i>			
Sex			
Female	15.5%	15.0%	15.6%
Male	9.5%	8.9%	9.6%
Age			
18 - 39	16.4%	15.7%	16.6%
40 - 49	14.8%	14.0%	15.0%
50 - 59	11.3%	11.2%	11.3%
60 - 69	8.2%	7.7%	8.4%
70 +	6.8%	6.3%	6.9%
Race*			
White	10.5%	10.3%	10.5%
Black	8.9%	7.9%	9.1%
Other	14.5%	12.0%	14.8%
Unknown	10.4%	8.5%	10.8%
Ethnicity			
Not Hispanic	10.1%	9.7%	10.1%
Hispanic	11.9%	9.4%	12.3%
Unknown	9.7%	8.3%	10.0%
Urban			
Yes	10.4%	9.8%	10.6%
No	9.1%	9.3%	9.1%
Unknown	13.0%	11.0%	13.0%
Average driving time to VA primary care (minutes)			
0-10	11.9%	9.4%	12.4%
11-20	12.5%	10.1%	13.0%
20-30	11.9%	9.8%	12.3%
30-40	10.8%	9.6%	11.1%
40-60	9.9%	8.4%	10.2%

>60	9.3%	8.7%	9.4%
<i>Mental Health Conditions</i>			
Anxiety	10.8%	9.6%	11.1%
Depression	9.9%	8.4%	10.2%
PTSD	9.3%	8.7%	9.4%
<i>Chronic Conditions</i>			
CVD	13.7%	13.2%	13.8%
Diabetes	13.1%	12.3%	13.2%
Obesity	13.2%	12.8%	13.3%

Notes: Each cell in the table represents the percent of users of any CIH therapy for each selected demographic or clinical characteristic overall (left column) and by Flagship status (middle and right columns)

Table 4. Demographic and Clinical Characteristics of Veterans with Chronic Musculoskeletal Pain by Flagship Status, FY17

Characteristic	Overall (N=874,499)	Flagship (n=148,583)	Non-Flagship (N=725,916)
<b>Demographics</b>			
Female	11.8%	12.0%	11.7%
Male	88.2%	88.0%	88.3%
<b>Age</b>			
18 - 39	10.5%	10.0%	10.6%
40 - 49	11.5%	11.6%	11.5%
50 - 59	21.6%	21.7%	21.6%
60 - 69	33.5%	34.0%	33.5%
70 +	22.8%	22.8%	22.8%
<b>Race*</b>			
White	66.0%	68.9%	65.4%
Black	24.9%	23.1%	25.3%
Other	2.7%	2.0%	2.8%
Unknown	6.5%	6.0%	6.5%

Ethnicity			
Not Hispanic	91.0%	91.9%	90.8%
Hispanic	7.0%	6.2%	7.2%
Unknown	1.9%	1.9%	2.0%
Urban			
Yes	78.2%	78.6%	78.2%
No	20.5%	21.3%	20.3%
Unknown	1.3%	0.1%	1.5%
Average driving time to VA primary care (minutes)			
0-10	28.1%	27.2%	28.3%
11-20	35.3%	36.1%	35.2%
20-30	18.2%	17.9%	18.3%
30-40	9.0%	9.3%	9.0%
40-60	7.1%	7.5%	7.0%
>60	2.2%	1.9%	2.2%
<i>Mental Health Conditions</i>			
Anxiety	9.0%	18.5%	17.8%
Depression	7.1%	29.4%	27.0%
PTSD+	2.2%	28.8%	28.1%
<i>Chronic Conditions</i>			
CVD	17.9%	66.2%	68.4%
Diabetes	27.4%	29.8%	29.3%
Obesity	28.2%	23.3%	23.4%

Notes: Each cell in the table represents the percent Veterans for each selected demographic or clinical characteristic overall (left column) and by Flagship status (middle and right columns)

Figure 2. Observed Changes in the % of Users of Any CIH Therapy Stratified by Flagship Status, FY 2017-2019

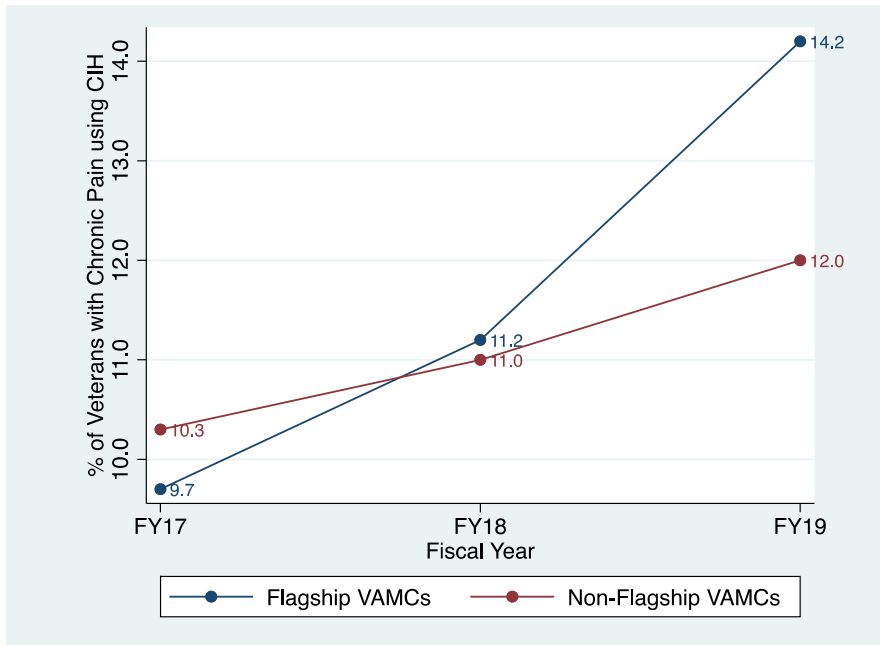


Figure 3. Changes in Predicted Probabilities of Being a CIH Therapy User Stratified by Flagship Status, FY 2017-FY2019

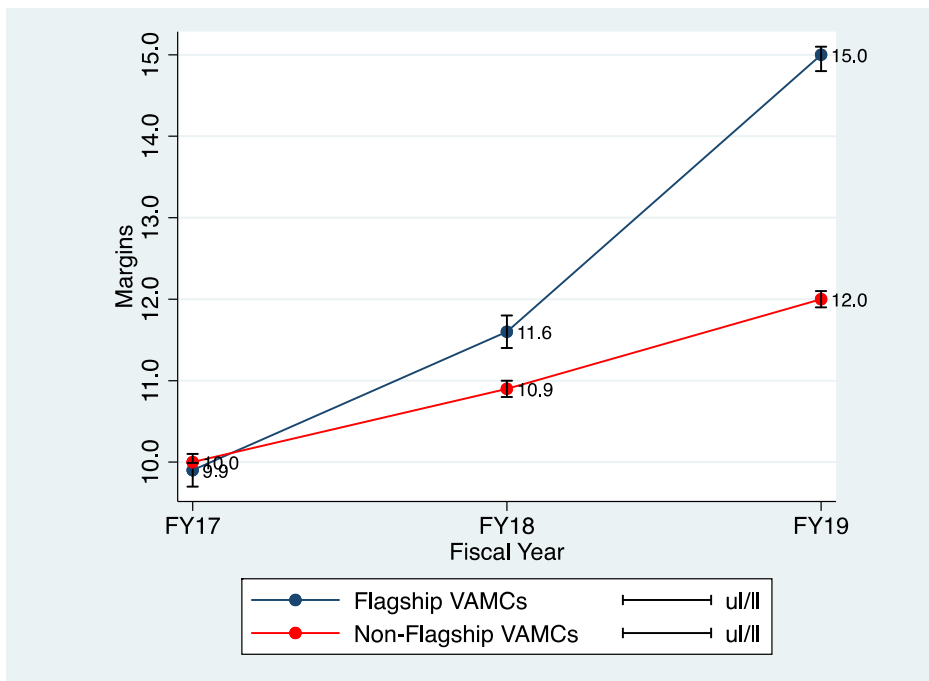


Table 5. Coefficient Table for Population Average Logit Model

Variable	Odds Ratio	CI LL	CI UL	P-Value
<b>Flagship status</b>				
Non-Flagship	Ref.	-	-	-
Flagship VAMC	0.98	0.97	1.00	0.13
<b>Fiscal Year</b>				
2017	Ref.	-	-	-
2018	1.10	1.09	1.11	<.001
2019	1.23	1.22	1.24	<.001
<b>Flagship*FY</b>				
Non-Flagship#2018	Ref.	-	-	-
Flagship#2018	1.09	1.07	1.12	<.001
Non-Flagship#2018	Ref.	-	-	-
Flagship#2019	1.31	1.29	1.34	<.001
<b>Sex</b>				
Female	Ref.	-	-	-
Male	0.71	0.70	0.72	<.001
<b>Age Group</b>				
18-39	Ref.	-	-	-
40-49	1.01	1.00	1.03	0.12
50-59	0.86	0.85	0.88	<.001
60-69	0.66	0.65	0.67	<.001
70+	0.55	0.54	0.56	<.001
<b>Race</b>				
White	Ref.	-	-	-
Black	0.79	0.78	0.80	<.001
Other	1.29	1.26	1.33	<.001
Unknown	0.98	0.96	1.01	0.18
<b>Ethnicity</b>				
Not Hispanic	Ref.	-	-	-
Hispanic	1.04	1.02	1.06	<.001
Unknown	0.96	0.92	1.00	0.05

Urban/rural status of Veterans				
Urban	Ref.	-	-	-
Rural residence	0.98	0.97	0.99	0.01
Unknown	0.96	0.94	0.98	<.001
Drive Time to Primary VAMC (minutes)				
0-10	Ref.	-	-	-
11-20	1.02	1.01	1.04	0.01
21-30	0.96	0.94	0.98	<.001
31-40	0.84	0.82	0.86	<.001
41-60	0.76	0.73	0.78	<.001
>60	0.75	0.71	0.79	<.001
Anxiety diagnosis	1.17	1.16	1.18	<.001
Depression diagnosis	1.21	1.20	1.22	<.001
PTSD diagnosis	1.30	1.28	1.31	<.001
Diabetes diagnosis	0.96	0.95	0.97	<.001
Cardiovascular disease diagnosis	0.94	0.93	0.95	<.001
Obesity diagnosis	1.21	1.20	1.22	<.001
System Complexity				
1a	Ref.	-	-	-
1b	1.00	0.98	1.01	0.58
1c	0.97	0.95	0.98	<.001
2	0.93	0.92	0.95	<.001
3	1.58	1.56	1.61	<.001
Unknown	1.05	0.96	1.15	0.27
Receipt of targeted Whole Health grants				
No receipt	Ref.	-	-	-
Receipt of targeted Whole Health grants	1.17	1.16	1.19	<.001



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## **CHAPTER 3: Organizational Factors Associated with Adoption of VA-based CIH Therapy Visits for Veterans with Chronic Musculoskeletal Pain**

### **Introduction**

As of 2017, VAMCs were mandated by the Undersecretary of Health to provide access to 8 evidence-based CIH therapies for Veterans enrolled in the VA.<sup>1</sup> These include: acupuncture, biofeedback, clinical hypnosis, guided imagery, therapeutic massage, meditation, Tai Chi/Qigong, and yoga. VAMCs can provide access to these therapies either by directly providing services within VA facilities or by referring Veterans to VA-funded community care.<sup>2</sup> In a study using data collected from 131 VA medical centers in 2017 and 2018, Farmer et al. found that, on average, VAMCs directly provided five core CIH therapies.<sup>3</sup> Presently, the VA only pays for three CIH therapies in the community: acupuncture, chiropractic care, and massage therapy. Preliminary data suggest that two-thirds of all CIH therapy visits within VA are provided via VA-funded community care.<sup>4</sup>

Access to VA-funded community care is an important benefit for Veterans, particularly for those that may live far from or have limited options available at their VAMC. However, overreliance on community-based care can increase care fragmentation for Veterans and also negatively impacts how much VAMCs invest in building robust, comprehensive internal CIH therapy programs. Research on other types of VA-funded community care suggests that VA-funded community care is on average lower quality than care provided directly within VA, may create care coordination challenges, and may be more costly for some conditions compared to VA care.<sup>5-7</sup> Additionally, community care providers are paid by the VA on a fee-for-service basis, which might incentivize overtreatment.<sup>8</sup>

There is significant variation in the extent to which VAMCs offer VA-based CIH therapies. Some VAMCs rely almost exclusively on community-based providers while others provide the bulk of CIH therapy care internally. This variation motivates the need to better

understand organizational factors associated with their provision within VAMCs. Informed by Greenhalgh's Implementation of Innovations in Health Service Delivery and Organization theoretical model, this study examined three types of organizational factors that could influence how much VAMCs adopt building CIH therapy programs internally. Broadly, they include: 1) system antecedent factors (i.e., characteristics inherent to organization) such as rurality and slack resources; 2) system readiness factors related to implementation (e.g., dedicated resources, slack resources); and 3) distribution method of CIH therapies throughout the VA (e.g., passive diffusion or active dissemination).<sup>9</sup> As health systems increasingly integrate novel, non-pharmaceutical interventions like CIH therapies into conventional care, it is useful to understand organizational factors impacting their provision within the largest integrated healthcare system in the United States.

This study has two aims.

**Aim 1:** Describe VAMC-level variation related to the provision of VA-based and community-based CIH therapy visits for Veterans

**Aim 2:** Investigate organizational characteristics associated with use of VA-based CIH therapies by Veterans

## **Methods**

### Data source

CIH therapy data for this study came from the VA Complementary and Integrative Health Evaluation Center QUERI's (PI: Taylor, Zeliadt) Data Nexus project database. See paper 1 for a full description of this data source, including how VA and community-based CIH data were collected. Data capturing CIH therapy utilization, and select Veteran demographic and clinical characteristics of VAMC patient populations from FY 2017-2019 were included in this study from the database. While not mandated to be provided by VAMCs, chiropractic care and Battlefield Acupuncture are two of the most commonly used CIH therapies within the VA<sup>4</sup> and therefore

were included in this study. Organizational variables were collected from a variety of sources. System complexity, urban/rural designation of VAMCs, and the number of Veteran patients in a VAMC were collected from the VA Support Service Center. The support service center contains a dashboard containing select utilization and organizational data available to internal VA researchers. The number of CIH programs in VAMCs in 2017-2018 were collected from CIHEC QUERI's Environmental Scan of CIH Provision project.<sup>3</sup> The VA Office of Patient Centered Care and Cultural Transformation provided data on VAMCs receiving small, targeted Whole Health System grants from 2014-2018.

### Research Design and Study Sample

This study uses a cross-sectional design. The unit of analysis is the VAMC (n=126). The period from FY 2017-FY 2019 is considered as a single time unit to increase the number of observations for VAMCs and to understand utilization over a longer time period. Data for the two dependent variables (described below) were restricted to Veterans with chronic musculoskeletal pain because the VA is specifically targeting them for CIH therapy use.<sup>4</sup> A Veteran was considered to have chronic musculoskeletal pain if they had musculoskeletal (MSK) pain diagnosis or had at least two Numeric Rating Scale scores  $\geq 4$  separated by at least 30 days in the year prior to their index visit (i.e. the first primary care or mental health visit in FY 2017, FY2018, or FY 2019). For the Numeric Rating Scale, patients are asked to circle the number between 0 and 10 that fits best to their pain intensity. Zero represents 'no pain at all' and 10 represents 'the worst pain ever possible'.<sup>10</sup> This definition of chronic pain was developed by the Pain Management Collaboratory, which is comprised of eleven clinical trials studying nonpharmacological approaches for the management of pain Military and Veterans healthcare systems.<sup>11</sup>

### Variables

### *Dependent Variables*

The primary dependent variable is the percent of CIH therapy visits that are VA-based (rather than VA-funded community care). It was calculated by dividing the number of VA-based visits by the total number of visits for each VAMC. Values fall between 0 and 1. The model using this dependent variable directly addresses the aim two objective.

To better contextualize the results of the primary dependent variable, a secondary dependent variable was created. This variable is the total (VA and VA-funded community care) number of CIH therapy visits per 1,000 Veterans with chronic musculoskeletal pain. It was calculated by dividing the number of CIH therapy visits by the number of Veterans with chronic musculoskeletal pain, multiplied by 1,000. This variable is continuous. It was included to help understand findings from the primary dependent variable model, which does not take into account total provision of CIH therapies by VAMCs.

For both dependent variables, visits for ten CIH therapies of interest (acupuncture, chiropractic care, massage, battlefield acupuncture, yoga, meditation, Tai Chi/Qigong, hypnosis, guided imagery, biofeedback) were used to calculate visit totals. Each VAMC included in the study had three years (FY 2017-FY2019) of data on VA-based and VA-funded community care CIH therapy visits for the ten CIH therapies.

### *Explanatory Organizational Variables*

System antecedent variables included in this study were: 1) system complexity; and 2) urban/rural status of the VAMC. System complexity indicates the level of complexity of a Veteran's VAMC. It includes five levels (1a, 1b, 1c, 2, and 3) that indicate the clinical complexity of the facility.<sup>12</sup> The VA determines facility complexity based upon a formula that considers the size of the patient population, patient risk, and the level of intensive care units and complex clinical programs. This was included because it is hypothesized that adoption of CIH therapies within facilities may be influenced by the complexity of the facility (e.g., complex systems have

more resources to draw upon, including academic medical center affiliations, that may make them more cosmopolitan and more able to start new programs). The FY2017 designation was used for this study (this measure is only updated every 3 years). Urban/rural status (0=no, 1 = yes) of the VAMC was included because it was hypothesized that rural areas might have different patient populations than urban areas as it relates to attitudes towards and exposure to CIH therapies. There also may be fewer community resources for rural VAMCs to leverage (e.g., hiring CIH therapy providers) to build their own CIH therapy programs.

System readiness variables included in this study were: 1) status of VAMC's receiving small grants to implement Whole Health System activities between 2014-2018 (this is not the Flagship pilot); and 2) the number of CIH therapies available for use at VAMCs in FY 2017-2018. Approximately 50 VAMCs received very small grants (i.e., dedicated resources) to implement Whole Health System activities between FY 2014 and 2018. These grants were administered to VAMCs to help support their transition to a Whole Health System model of care<sup>13</sup> that is being implemented across the VA. This variable is a binary (0=no, 1=yes). Number of VA-based CIH therapies (of the ten in this study) available for use within VAMCs in 2017-2018 was included because VAMCs with more available therapies (i.e., structural readiness to offer CIH therapies) should provide more CIH therapies to Veterans internally. This variable was grouped into five categories to allow for interpretation at multiple levels of CIH offerings (0-2, 3-4, 5-6, 7-10, unknown).

Distribution of CIH therapies through the VA (i.e., active vs. passive dissemination) is represented by the Flagship status variable. This is a binary variable and indicates if a VAMC participated as a Whole Health System Flagship site (0=no, 1 = yes). In total, eighteen Flagship VAMCs received substantive financial funding and technical support from the Office of Patient Centered Care and Cultural Transformation to assist with expansion and implementation of CIH therapies and other Whole Health System activities from FY2018-2020. Non-Flagship VAMCs did not receive these resources but were expected to expand access.



### *Control variables*

Characteristics of the patient populations that may impact demand for CIH within VAMCs were included as covariates. These include percent of Veterans with select chronic physical conditions (CVD, COPD, obesity, diabetes), select mental health conditions (depression, anxiety, PTSD), and age. Data show that Veterans with these chronic physical and mental health conditions and younger Veterans are much more likely to use CIH therapies.<sup>4</sup> As a result, there may be higher demand at VAMCs with larger shares of these populations, which may affect the number of VA-based CIH therapy visits made, and therefore they were included as covariates.

### Statistical analyses

Descriptive statistics were calculated on characteristics of VAMCs and adjusted counts of VA-based and VA-funded community care visits for 10 CIH therapies from FY 2017-FY2019. A multivariate linear regression model was conducted for the primary and secondary dependent variables. Multivariate linear regression was chosen because the dependent variables are continuous and the sample size is large enough ( $n=126$ ) for the central limit theorem to apply. Both models include all of organizational explanatory variables of interest and control variables. Multicollinearity between predictor variables was shown to be low and within the acceptable statistical range ( $VIF < 3$  for all variables).<sup>14</sup> Predicted probabilities for the organizational variables of interest were calculated for each model and are presented in Figures 1 and 2.

A longitudinal model that included an interaction term for fiscal year (FY's 2017, 2018, 2019) and Flagship status was run as a sensitivity analysis for the primary dependent variable to test changes in the percent of care that is VA-based over time in Flagship and non-Flagship VAMCs. This analysis was run because results from Paper 1 showed that user rates of CIH

therapies increased significantly more in Flagship VAMCs than non-Flagship VAMCs from FY 2017-2019.

A sensitivity analysis was also conducted to determine regional variation of the outcome measures. It is hypothesized that use and adoption of CIH therapies varies by region due to cultural factors.

SQL software was used to extract data from the CDW. Data were analyzed in Stata 15.1.

## **Results**

In total, 126 VAMCs were included in this study (Table 1). Eighteen VAMCs (14%) were Flagship sites and forty-nine (39%) received small grants to implement targeted Whole Health activities from 2014-2018. Approximately two-thirds of the VAMCs were high complexity (1a, 1b, or 1c) at the time of the study and 12% were designated as rural. In 2017-2018, approximately 34% of VAMCs had 4 or fewer CIH programs and 43% had 5 or more CIH programs (22% of VAMCs were missing data for this variable). On average, VAMCs had 41,876 total Veteran patients annually, which included 21% with a chronic musculoskeletal pain diagnosis, 31% with select mental health conditions (depression, anxiety, PTSD), and 72% with a select chronic condition (obesity, diabetes, COPD, or cardiovascular disease). The average age of all Veterans was 63 years old. For all Veterans, about two-thirds of all CIH therapy visits occurred through VA-funded community care providers during the study period.

Table 2 shows visit rates per 1,000 chronic musculoskeletal pain patients for ten CIH therapies within the VA and through VA-funded community care providers during the study period. For the three therapies that Veterans can access through community-based providers via referral from the VA (acupuncture, chiropractic care, massage), visit rates in the community are at least twice as high compared to VA-based visits. Visit rates for CIH therapies only available in the VA are considerably lower than visit rates for community accessible therapies. Additionally,

as can be seen in Figure 1, rates of VA-based CIH visits vary considerably by VAMC and are highly correlated with how much care is being referred to the community.

Results from the primary dependent variable model (% of total CIH therapy visits that are VA-based) can be seen in Table 3. Mean predicted probabilities for the organizational characteristics of interest are shown in Figure 2 along with corresponding 95% confidence intervals. There were no statistically significant differences observed for the Flagship variable (41% of visits in the VA for Flagship VAMCs vs 38% for non-Flagship VAMCs;  $p=.38$ ), the “receipt of targeted Whole Health grants” variable (41% visits in the VA for VAMCs receiving grants vs. 36% VAMCs not receiving grants;  $p=.11$ ), and the “urban/rural status” variable (41% visits in the VA for rural VAMCs vs. 38% for urban VAMCs;  $p=0.30$ ). The percent of visits in the VA were significantly higher for the highest complexity (1a) VAMCs compared to medium complexity VAMCs (43% in the highest complexity VAMCs vs. 26% in medium complexity VAMCs;  $p<0.001$ ). The largest effect in this model was observed for the “number of CIH therapies in FY 2017-2018” variable. VAMCs with more CIH therapy options internally provided a considerably higher percentage of VA-based visits compared to VAMCs with fewer CIH therapies. For example, VAMCs with 5-6 and 7-10 CIH therapies provided 45% and 54% of all CIH therapy visits internally compared to 23% and 24% in VAMCs with 0-2 and 3-4 therapies, respectively. For VAMCs with 5-6 ( $p<0.001$ ) and 7-10 ( $p<0.001$ ) CIH therapies, the differences were statistically significant compared to the referent group, 0-2 therapies.

Results from the secondary dependent variable model (total CIH therapy visits) can be seen in Table 4. Mean Predicted probabilities for the organizational characteristics of interest are shown in Figure 3 along with corresponding 95% confidence intervals. Minimal variability was observed for organizational variables in this model. For example, Flagship VAMCs provided 1,261 total (VA and community-based) CIH therapy visits per 1,000 Veterans with chronic musculoskeletal pain compared to 1,195 visits in non-Flagship VAMCs ( $p=0.6$ ), controlling for other variables in the model. There were also no statistically significant differences observed for

the “receipt of targeted Whole Health grants” variable (1,186 visits per 1,000 for VAMCs receiving grants vs. 1,232 visits per 1,000 for VAMCs not receiving grants;  $p=.62$ ) and the “urban/rural status” variable (1,259 visits per 1,000 for rural VAMCs vs. 1,199 per 1,000 for urban VAMCs;  $p=0.67$ ). For system complexity, low complexity VAMCs provided the most visits (1,636 per 1,000), which was significantly more ( $p<0.001$ ) compared to the referent group, 1a high complexity (1,097 per 1,000). Although results were not statistically significant, VAMCs with the most VA-based CIH therapies available for use internally provided fewer total visits than VAMCs with less VA-based CIH therapies. For example, VAMCs with 5-6 (1,191 visits per 1,000) and 7-10 VA-based therapies (1,118 visits per 1,000) provided fewer visits than VAMCs with 0-2 CIH therapies (1,312 visits per 1,000).

Results from the longitudinal sensitivity analysis (longitudinal multivariate regression model; Figure 4) shows the percent of visits provided internally increased 36% in Flagship VAMCs over the study period (from 35% in FY 2017 to 48% in FY 2019), but decreased by 2% in non-Flagship VAMCs (from 38% in FY 2017 to 37% in FY 2019). Most of the change was observed in the 3<sup>rd</sup> study year (2<sup>nd</sup> year of the Whole Health System Flagship pilot). However, the observed differences were not statistically significant in either FY 2018 ( $p=.65$ ) or FY 2019 ( $p=0.11$ ).

Tables 5 and 6 show variation of the dependent variables by region. As can be seen in Table 6, there is substantial variation by region. For example, VAMCs in the Northwest provided over three times as many CIH therapy visits to Veterans with chronic musculoskeletal pain compared to VAMCs in the South. The percent of CIH therapy care that was VA-based also varied substantially by region (from 24% in the Southwest to 46% in the Northeast).

## **Discussion**

In this study of CIH therapy visits across 126 VAMCs, there was wide variation in how much VA-based care was provided, with some facilities relying almost exclusively on community-

based providers and others providing most services internally. On average, the total number of CIH therapy visits (VA and community-based) varied minimally for the organizational variables of interest among Veterans with chronic musculoskeletal pain. For the model investigating organizational variables associated with the primary dependent variable (% of CIH therapy care that is VA-based), the number of VA-based CIH therapies offered internally was the most significant predictor of more care being VA-based rather than community-based. Rurality, Flagship status, and receipt of targeted Whole Health System grants were not associated with more VA-based care.

The key finding from this study is that VAMCs with fewer VA-based CIH therapies available still provided as many or more total visits on average as VAMCs with more VA-based CIH therapies available on-site, due to greater reliance on VA-funded community care. VAMCS with 5-6 and 7-10 VA-based CIH therapy options on-site provided roughly half of all CIH therapies directly; by contrast, VAMCs with only 0-2 or 3-4 therapies available on-site provided only 25% of CIH therapies directly. While it is a positive sign that VAMCs with minimal VA-based CIH therapy options on-site are able to ensure equivalent access to CIH for Veterans by relying on VA-funded community care, there are a few implications for the VA to consider. First, reliance on VA-funded community care often occurs at the expense of VAMCs' ability to develop comprehensive, high-quality internal CIH therapy programs. Heavy reliance on community-based providers may also have negative cost implications for the VA, as contracted providers are paid on a fee-for-service basis and may be more likely to overtreat and provide lower quality care.<sup>5,8</sup> There are also administrative costs related to coordinating referrals and care, and care coordination between community-based providers and VA primary care providers adds additional complexity for VA administrative staff and providers.<sup>15</sup> Third, heavy reliance on community-based providers may increase risk of care fragmentation, as it can be more difficult for the VA providers to coordinate care with non-VA providers.<sup>7</sup> Over time, differential reliance on VA-funded community care could also contribute to inequities in care for Veterans. While

every VAMC will differ in their ability to offer VA-based CIH therapies, the VA should carefully consider cost and care implications associated with reliance on VA-funded community care. To the extent that development of internal CIH capacity is a priority, the VA might also consider strategically targeting VAMCs with a low percentage of VA-based CIH visits for internal technical assistance and capacity building efforts.

Another key finding from this study is that rural sites provided as much total and VA-based CIH therapy visits as urban VAMCs. It was hypothesized that rural VAMCs might struggle to provide CIH therapy care compared to urban VAMCs due to lack of resources and differing cultural attitudes towards CIH therapies. Rural VAMCs are typically smaller and have simpler scope of services, which may allow them to transform their delivery services more quickly than larger, urban VAMCs. The ability to be more nimble was noted in a paper by Stephanie Taylor, which found that rural VAMCs were more accustomed to being innovative and problem-solving when it came to building CIH therapy programs.<sup>16</sup>

Although the dependent variables did not vary by rurality of VAMCs, a sensitivity analyses revealed that there was substantial variation by geographical region. In particular, use of CIH therapies was low in the South and Southwest regions and higher in Northwest, Northeast, and Mountain West regions. While it is not clear what is driving this geographical variation, I would hypothesize that the Veterans in the South in particular might view CIH therapies more skeptically, which might affect adoption and use within VAMCs. The VA should consider investigating regional variation of CIH therapy more closely and, based on the findings, tailor specific strategies towards overcoming lack of use and adoption in the South and Southwest regions.

Future research could examine cost, care, and use implications for CIH therapy care going to community rather than being provided in VAMCs. Future research might also consider additional system readiness factors, such as leadership, that likely play important roles in impacting adoption within VAMCS.<sup>17</sup> Qualitative research among VAMC leadership and

administration could also help to illuminate granular factors driving quantitative results from this study. Last, future research should consider the extent to which CIH therapy care outsourced to VA-funded community care impacts the budgets available to VAMCs for building internal CIH therapy programs, as this is not currently understood.

### **Strengths and Limitations**

The strengths of this study include the large sample, validated methods for capturing CIH therapy visits among Veterans (see Chapter 2), and the inclusion of a variety of organizational factors. The primary limitation is the ecological design of the study. As a result of this limitation, findings from the model describe associated relationships rather than causal relationships. In addition, this study did not include a number of other organizational factors that may impact VA-based CIH care (e.g., leadership) which likely play a significant role in the adoption of CIH therapies within VAMCs. The VA has many large community-based outpatient clinics located separate from a VAMC. For this study, these clinics were assigned to a VAMC based on geographical proximity. The system complexity measure only captures the complexity of VAMCs and may not be representative of the community-based outpatient clinics where many Veterans receive their care.

### **Conclusion**

As the VA aims to increase use of CIH therapies for Veterans with complex conditions such as chronic pain, it is important to consider where care is being delivered due to cost implications for the VA and limited offerings through community-based providers. Offering VA-based CIH programs that include the eight mandated therapies give Veterans and providers more options to treat complex conditions and is in line with the mission of the Whole Health System model of care currently being implemented in the VA, which emphasizes integration of CIH therapies into standard medical care.<sup>13</sup>

## **CHAPTER 2:** Appendix

Table 1. Organizational Characteristics of VAMCs, FY 2017-2019

Table 2. Mean Number of VAMC-based CIH Therapy Visits per 1,000 Chronic Musculoskeletal Pain Patients, FY 2017-FY2019

Figure 1. Scatterplot of VA and VA-Funded Community-Based CIH Therapy Visits by VAMCS, FY2017-FY2019

Table 4. Coefficient Table for Secondary Dependent Variable Multivariate Regression Model (Number of Total CIH Visits per 1,000 Chronic Musculoskeletal Pain Patients)

Table 3. Coefficient Table for Primary Dependent Variable Multivariate Regression Model (% of CIH Therapy Visits within VAMC)

Figure 2. Mean Predicted Probabilities of Percent of CIH Visits Occurring within VAMC's by Organizational Characteristics, FY 2017-FY 2019

Figure 3. Mean Predicted Probabilities of Total CIH Visits per 1,000 Chronic Musculoskeletal Pain Patients by Organizational Characteristics, FY 2017-2019

Table 5. Regional Variation of Outcome Measures by VISN

Table 6. Regional Variation of Outcome Measures by Geography



Table 1. Organizational Characteristics of VAMCs, FY 2017-2019

<b>Characteristic</b>	<b>All VAMCs (N=126)</b>
<i>System Characteristics</i>	
% Flagship Sites	14%%
<i>System complexity</i>	
1a - High complexity	31%
1b - High complexity	16%
1c - High complexity	15%
2 - Medium complexity	13%
3 - Low complexity	23%
Unknown	1%
% Rural VAMCs	12%%
% of VAMCs receiving targeted Whole Health grants from FY 2014-2018	39%
<i># of core CIH programs in VAMCs in 2017-2018</i>	
0-2	13%
3-4	21%
5-6	22%
7-9	21%
Unknown	22%
<i>Veteran Characteristics of VAMCs</i>	
Average # of Veterans	40,876
% diagnosed with chronic musculoskeletal pain	21%
% with select chronic conditions*	72%
% with select mental health conditions**	31%
Average Veteran age	63
<i>CIH Therapy Utilization</i>	
Number of VA-based CIH therapy Visits	2,016,265
Number of community-based CIH therapy visits	4,415,503

\*Includes a diagnosis of diabetes, obesity, COPD, or CVD

\*\*Includes a diagnosis of depression, anxiety, or PTSD in the study period

Table 2. Mean Number of CIH Therapy Visits per 1,000 Chronic Musculoskeletal Pain Patients, FY2017-FY2019

<i>CIH Therapy</i>	VA-Based Visits	VA-Funded Community Care Visits
<i>Community Accessible</i>		
Chiropractic care	157.7	362.7
Acupuncture - traditional	112.4	331.3
Massage	34.7	114.6
<i>VA Accessible Only (BFA &amp; Mind Body)</i>		
Acupuncture - battlefield	34.6	
Yoga	33.3	-
Meditation	19.6	-
Tai Chi/Qigong	18.9	-
Biofeedback	6.9	-
Guided imagery	1.0	-
Hypnosis	1.2	-
<b>Total</b>	<b>420.4</b>	<b>808.6</b>

Figure 1. Scatterplot of VA and VA-Funded Community-Care CIH Therapy Visits by VAMCS, 2017-2019

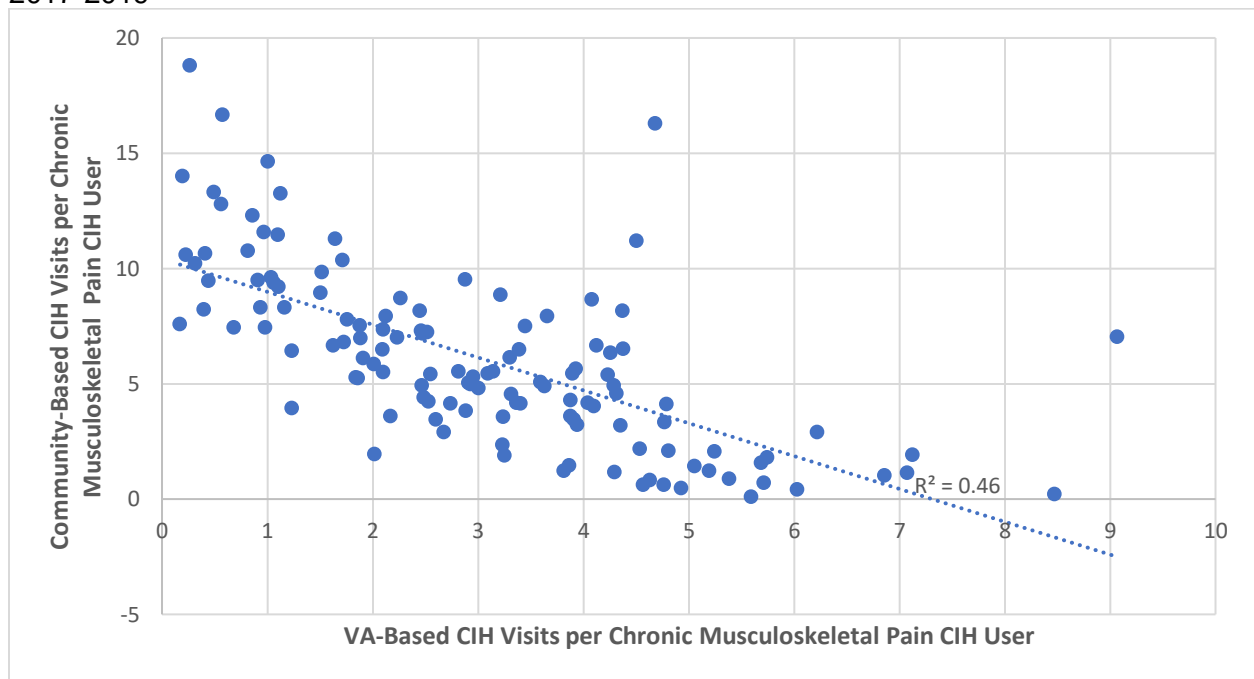


Table 3. Coefficient Table for Primary Dependent Variable Multivariate Regression Model (% of CIH Therapy Visits within VAMCs)

Variable	Coefficient	CI LL	CI UL	P- Value
<i>System Characteristics</i>				
Flagship status				
Non-Flagship	Ref.	-	-	-
Flagship VAMC	0.03	0.04	0.11	0.38
System Complexity				
1a - High complexity	Ref.	-	-	-
1b - High complexity	-0.04	0.12	0.04	0.31
1c - High complexity	0.00	0.08	0.08	0.99
2 - Medium complexity	-0.18	0.27	0.08	<0.001
3 - Low complexity	-0.06	0.14	0.02	0.14
Unknown	-0.25	0.54	0.03	0.08
Urban/Rural status of VAMCs				
Urban	Ref.	-	-	-
Rural	0.04	0.04	0.13	0.30
Unknown	0.00	0.39	0.40	0.98
Receipt of targeted Whole Health System grants				
No	Ref.	-	-	-
Yes	0.05	0.00	0.11	0.06
Number of CIH therapies* in FY 2017-2018				
0-2	Ref.	-	-	-
3-4	0.01	0.09	0.10	0.87
5-6	0.21	0.12	0.30	<0.001
7-10	0.30	0.21	0.39	<0.001
Unknown	0.16	0.07	0.25	<0.001

<i>Covariates</i>				
% Veterans with select chronic conditions**	0.01	0.01	0.02	<0.001
% Veterans with select mental health conditions***	0.00	0.00	0.01	0.43
Average patient age (per year)	0.00	0.01	0.02	0.60

\*Includes ten therapies shown in Table 2

\*\*Includes a diagnosis of diabetes, obesity, COPD, or CVD

\*\*\*Includes a diagnosis of depression, anxiety, or PTSD

R-Squared: 0.28

Table 4. Coefficient Table for Secondary Dependent Variable Multivariate Regression Model (Number of Total CIH Visits per 1,000 Chronic Musculoskeletal Pain Patients)

Variable	Coefficient	CI LL	CI UL	P-Value
<i>System Characteristics</i>				
Flagship status				
Non-Flagship	Ref.	-	-	-
Flagship VAMC	66.8	-186.9	320.5	0.61
System Complexity				
1a - High complexity	Ref.	-	-	-
1b - High complexity	-26.8	-288.2	234.5	0.84
1c - High complexity	-35.0	-309.8	239.9	0.80
2 - Medium complexity	-73.0	-372.1	226.2	0.63
3 - Low complexity	539.7	276.7	802.8	<0.001
Unknown	170.9	-767.4	1109.1	0.72
Urban/Rural status of VAMCs				
Urban	Ref.	-	-	-
Rural	60.2	-219.5	339.8	0.67
Unknown	-259.1	1565.1	1047.0	0.70

Receipt of targeted Whole Health System grants				
No	Ref.	-	-	-
Yes	45.6	-132.5	223.7	0.62
Number of CIH therapies* in FY 2017-2018				
0-2	Ref.	-	-	-
3-4	219.8	-93.4	533.0	0.17
5-6	-121.3	-421.2	178.5	0.43
7-10	-193.4	-493.6	106.7	0.21
Unknown	-388.9	-679.9	-97.8	<0.01
<i>Covariates</i>				
% Veterans with select chronic conditions**	-57.5	-78.5	-36.4	<0.001
% Veterans with select mental health conditions***	-12.7	-34.8	9.4	0.26
Average patient age (per year)	54.0	6.2	101.8	0.03

\*Includes ten therapies shown in Table 2

\*\*Includes a diagnosis of diabetes, obesity, COPD, or CVD

\*\*\*Includes a diagnosis of depression, anxiety, or PTSD

Note: Includes VA-based and VA-funded community care visits

R-Squared: 0.26

Figure 2. Mean Predicted Probabilities of Percent of CIH Visits Occurring within VAMC's by Organizational Characteristics, FY 2017-FY 2019

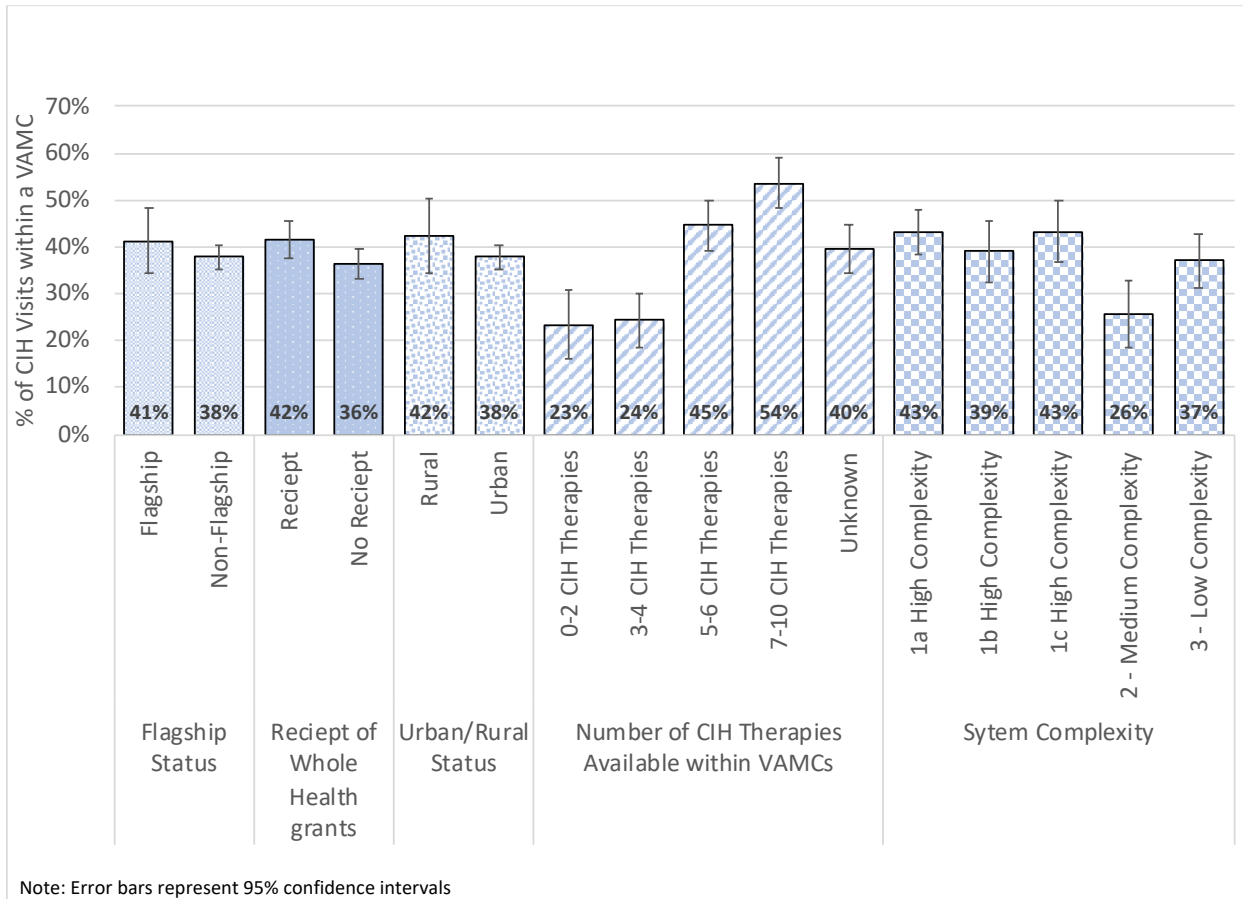
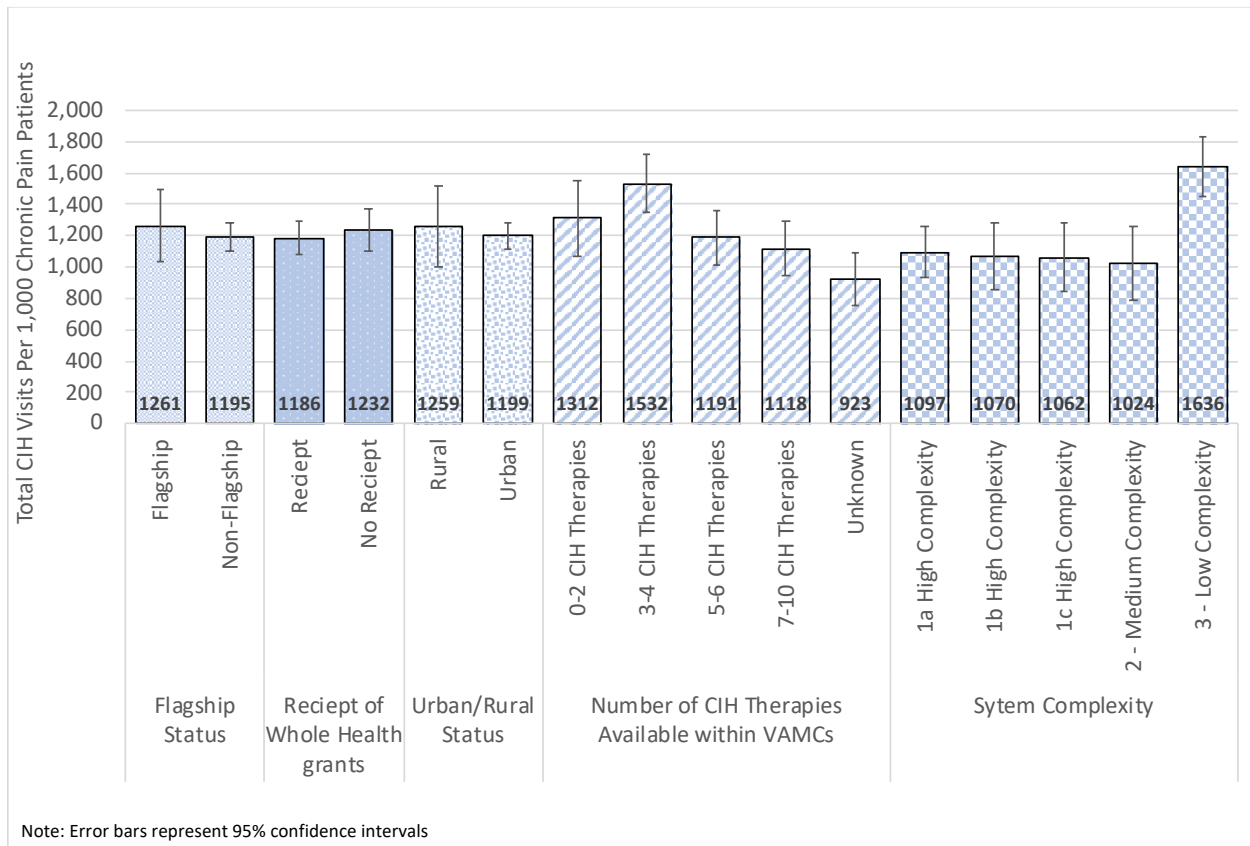


Figure 3. Mean Predicted Probabilities of Total CIH Visits per 1,000 Chronic Musculoskeletal Pain Patients by Organizational Characteristics, FY 2017-2019



Note: Includes VA-based and VA-funded community care visits

Figure 4. Predicted Probabilities of Providing CIH Therapy Care Within VAMCs by Flagship Status and FY, FY 2017-2019

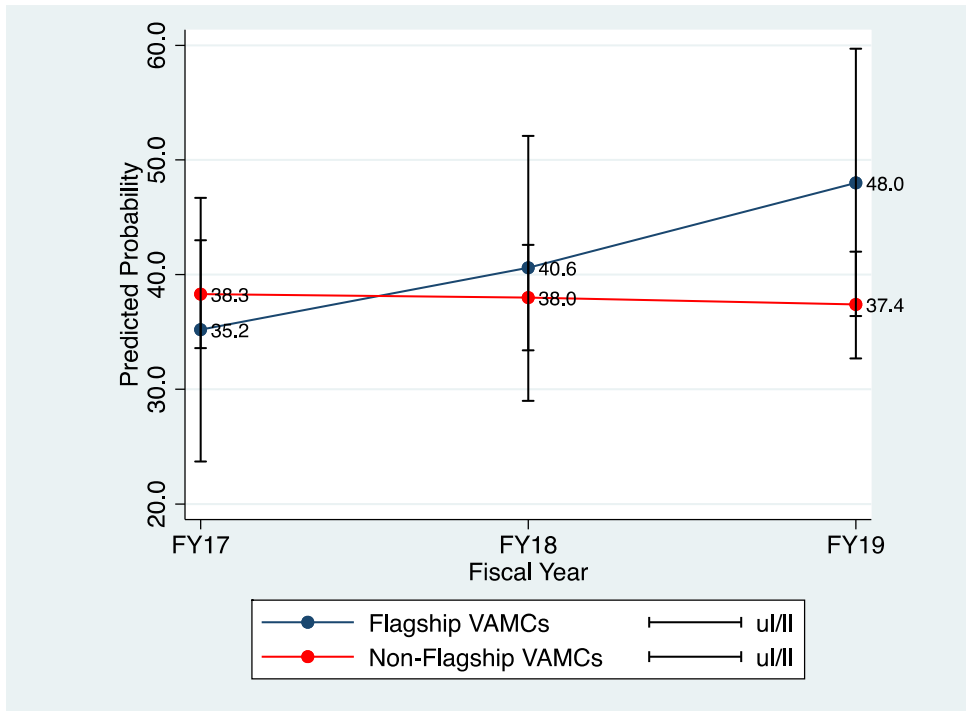




Table 5. Regional Variation of Outcome Measures by VISN

<b>VISN</b>	<b>Visits per 1,000 chronic musculoskeletal Veterans</b>	<b>% of Visits that were VA-based</b>
21	2,320	39%
1	1,801	29%
23	1,764	38%
20	1,697	21%
12	1,541	35%
2	1,355	72%
15	1,274	52%
10	1,183	50%
22	1,155	43%
19	1,132	36%
4	1,101	41%
8	979	43%
6	933	27%
9	869	11%
5	798	44%
18	740	4%
16	625	46%
17	611	26%
7	465	43%

Table 6. Regional Variation of Outcome Measures by Geography

<b>Region*</b>	<b>Visits per 1,000 chronic musculoskeletal Veterans</b>	<b>% of Visits that were VA-based</b>
Northwest	2,009	30%
Mountain West	1,405	40%
Northeast	1,264	46%
Upper South	1,071	32%
Mid-Atlantic	933	27%
Southwest	835	24%
South	690	44%

\*Grouped based on VISN geographical locations

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## **CHAPTER 4: Factors Impacting Use of CIH Therapies in the Veterans Health Administration for Veterans with Opioid Use Disorder**

### **Introduction**

Opioid use disorder (OUD) is a chronic, neurobiological disease characterized by problematic patterns of opioid use that cause significant impairment and distress.<sup>1</sup> The OUD population is medically complex and suffers from high rates of chronic pain, mental health disorders, and social problems.<sup>1</sup> Within the VA, there has been a sharp increase in the number Veterans diagnosed with OUD (from 25,000 in 2003 to 66,000 in 2017).<sup>2,3</sup> Additionally, Veterans face increased risk of opioid-related adverse events, including overdose and death, relative to the general population.<sup>4,5</sup>

While medication-assisted treatments can effectively reduce overdose and opioid-related morbidity<sup>6</sup>, a multi-modal approach that incorporates non-pharmacological interventions (NPI) offers patients and providers additional options to help treat biopsychosocial problems that often underlie OUD and associated chronic pain.<sup>1</sup> Some CIH therapies are common types of NPIs used to help treat OUD.<sup>6,7</sup> Available research has shown that CIH therapies can potentially help reduce use of opioids for patients using them for chronic pain.<sup>8</sup>

Prior studies suggest a number of factors might impact use of NPIs (including CIH therapies) among Veterans with OUD enrolled in the VA. In a study of the perceptions of VA primary care providers on reducing opioid use and increasing use of NPIs among Veterans with chronic pain (but not OUD specifically), it was found that opioid use creates unique challenges for providers trying to get their patients to use CIH therapies, including: 1) providers assume it is difficult to change existing patient preferences and expectations about using opioid medications to manage their chronic pain; 2) providers feel pressured into continuing to prescribe opioids to avoid major confrontations with patients; and 3) due to fears of resistance, providers lack training on how to successfully shift Veterans away from opioids and towards CIH therapies.<sup>9</sup>

Other research has shown that VA providers may also lack knowledge and education about CIH therapies, availability of CIH therapies within their VAMC, and how to integrate CIH therapies into pain care management.<sup>10-13</sup> Use by Veterans (not in the context of OUD) may be affected by lack of availability or accessibility, not understanding how CIH therapies can help their condition, and a lack of readiness to initiate behavior changes required to incorporate CIH therapies into their care.<sup>12,14</sup> Organizationally, administrative hurdles related to hiring and credentialing CIH therapy providers, insufficient multilevel leadership support or resource support (i.e., time, funds, space), and non-standardized descriptions of CIH therapies (e.g. names for meditation classes are different at every VAMC and continuously changing).<sup>10,11</sup>

In recent years, the VA has made extensive efforts to improve and expand access to CIH therapies for Veterans with complex medical conditions, including those with OUD. In 2018, it began a national deployment of Whole Health System model of care, an initiative aimed in part at expanding availability and provision of CIH therapies.<sup>15</sup> Around this time, the VA also initiated implementation projects in 62 VA facilities to improve access to MAT and CIH therapies for Veterans with OUD.<sup>16,17</sup> Further, Veterans can now more easily access select CIH therapies (acupuncture, chiropractic care, and therapeutic massage) through community-based providers (i.e., non-VA providers contracted with the VA to deliver healthcare services to Veterans enrolled in the VA) due to loosening of eligibility criteria by recent federal legislation.<sup>18</sup>

Using qualitative data collected from interviews with 45 providers (from primary care, addiction, pain clinics) and 17 Veterans from 5 VAMCs participating in an implementation project<sup>19</sup> to improve access to MAT and CIH therapies for Veterans with OUD, this study investigates system-, provider-, and patient-level factors impacting use of CIH therapies in the VA among Veterans with OUD. Factors of specific interest for this study include knowledge and attitudes of providers and Veterans towards using CIH therapies for OUD treatment and the system context in which services are accessed. Knowledge and attitudes towards using CIH therapies were chosen as factor for study because they impact the likelihood providers and

Veterans are willing to change behaviors towards OUD treatment.<sup>20</sup> System context was chosen to study to better understand the extent to which the VA is supporting providers and Veterans at incorporating CIH therapies into standard care for Veterans with complex conditions like OUD. This study's focus specifically on Veterans with OUD distinguishes it from other research that focused more generally on the chronic pain population using opioids. Results may inform the VA and other health systems around designing implementation strategies that consider the unique needs of Veterans with OUD.

This study has two aims:

**Aim 1:** Describe Veteran knowledge and attitudes related to using CIH therapies for Veterans diagnosed with OUD.

**Aim 2:** Describe knowledge and attitudes of VA providers related to incorporating CIH therapies into treatment for Veterans diagnosed with OUD.

**Aim 3:** Describe the system context in which Veterans and providers access and use CIH therapies within the VA or through community-based providers.

## **Methods**

### *Design and Participants*

Qualitative data were collected through interviews with Veterans and health care providers from five VAMCs in the Southwestern United States participating in the Partnered Implementation Initiative. Key clinical leaders involved in the project implementation at each facility were initially recruited to participate in the interviews. A snowball sampling strategy was then used to identify additional providers, which included primary care physicians, psychiatrists, pain specialists, nurses, and pharmacists. These providers were chosen because they were identified as being involved in care for Veterans with OUD. Pain and addiction providers identified Veterans diagnosed with OUD, who were then invited to participate in a brief interview

about use MAT and CIH therapies. Interviews were conducted in 2018 and 2019. In total, interviews were conducted with 17 veterans and 45 providers from five VAMCs.

The implementation project study team developed the interview guide. The interview guide for providers included: (a) perceived availability of CIH therapies at each VAMC; (b) ease of CIH therapy referrals, either within VA or the community; (c) provider and patient perceptions of the strength of the evidence base for CIH therapies for chronic pain and OUD; (d) perceived benefits of different CIH therapies for Veterans with chronic pain and OUD; and (e) other facilitators and barriers to CIH therapy use. The interview guide for Veterans included questions about: (a) prior experience with CIH therapies; and (b) factors influencing their use of CIH therapies through the VA.

All interviews in which participants agreed to be recorded were transcribed through a professional transcription company and imported into the qualitative software Atlas.ti for analysis.

### *Analysis*

Template analysis,<sup>20</sup> in which an initial codebook is refined to incorporate emergent themes within the data, was used for this study. The codebook was informed by Theoretical Domains Framework (TDF)<sup>20</sup> and Consolidated Framework for Implementation Research (CFIR).<sup>21</sup> TDF stipulates that knowledge and attitudes influence behavioral changes. Incorporating CIH therapies into standard medical care requires significant behavioral changes at the patient and provider level. CFIR considers how implementation is impacted by features of the implementing organization.

Initial codes were applied to a subset of five transcripts and then compared for consistency by a second person. The codebook was revised to clarify construct definitions or better highlight critical themes, including collapsing and removing codes. Using this finalized codebook, reviewer one coded 100% of the transcripts and reviewer two coded 20% of the



transcripts (every fifth interview as ordered in the Atlas.ti). Discrepancies in coding were discussed until consensus was reached. Analyses focused on identifying broad themes within the data as well as similarities and differences by respondent role (Veteran, provider) or VAMC, and discussion of CIH use for chronic pain or for OUD. Subthemes were also identified to highlight relevant distinctions within a theme.

## **Results**

### **Theme 1: Knowledge and Attitudes Towards CIH Therapies**

#### **Knowledge of CIH Therapies for OUD**

Most Veterans indicated they had experience using CIH therapies and most providers said they had experience referring Veterans to CIH therapies. The most commonly mentioned therapies by providers and Veterans were chiropractic care, acupuncture, mindfulness/meditation, and yoga.

Although most providers were aware that use of CIH therapies for chronic pain is well-supported by the scientific literature—and in fact expressed a sophisticated view of the scientific evidence for chronic pain, noting how effectiveness varies depending on the pain condition and type of CIH therapy--virtually no providers knew if CIH therapies are effective at reducing opioid use or helping treat patients with OUD. (*"Well, most CIH therapies, at least for my practice, I use it for pain. I must admit I don't know data for how well CIH therapies achieves good outcomes for patients with OUD"*). Providers had good knowledge of the effectiveness of CIH therapies based on personal experience treating Veterans, particularly those with chronic pain (*"One of my favorite stories is when [redacted name] was here and she was so cynical about CIH therapies and then she came back to me and said after her patient used a CIH therapy, it really changed their behavior. That's the most convincing thing to providers"*).

Patient knowledge of the effectiveness of CIH therapies was derived from personal experience rather than the scientific evidence, and most thought they worked for chronic pain. A

couple of Veterans noted they thought CIH therapies were effective for OUD specifically (*"And so, I saw the benefits there that holistic approach gave you know the with meditation and mindfulness, chiropractic, acupuncture. All of that combined with medication assistance is where I've seen the most benefit for me as well. You know, just taking methadone, which, there are periods in the last ten, twelve years that I just took methadone, I didn't go to groups, I didn't speak to my doctor, I didn't really have any other assistance it was just the methadone. That was the least helpful."*).

### **Attitudes Toward CIH Therapies as Treatment for OUD**

Most VA providers interviewed for this study had positive attitudes towards incorporating CIH therapies into treatment plans, particularly for chronic pain (*"Yeah. I think positive, really. And even if, you know, Veterans try and it doesn't help with their pain it's never—they never regret trying"*). Several providers also indicated that attitudes among other providers and Veterans towards CIH therapies in general have become more positive in recent years (*"I feel like even starting in my position, which I started like seven or eight years ago. I feel like, you know, people are much more open to these treatments. And I think even in the popular media, the word has been getting better about these treatments"*).

Providers had mixed attitudes towards incorporating CIH therapies into treatment plans for Veterans with OUD specifically. In general, providers liked having non-pharmaceutical options available for treating OUD, with several noting the difficulties of treating substance abuse with just medication alone (*"Oftentimes there's another reason, you know, obviously a reason for them that results in using substances or result in relapse. We want to make sure we address not just with medication but making sure they learn other coping mechanisms that are healthier."*). But many providers noted the challenges and expressed reservations about getting Veterans with OUD to use CIH therapies. In particular, several providers indicated that Veterans with OUD were more likely to resist using CIH therapies than Veterans with just chronic pain .

*("So the chronic pain patients are probably more likely to want CIH therapies—they would be more likely to use than the OUD patients.").* Reasons for more resistance from Veterans with OUD included fears about having opioids or MAT taken away and not understanding how CIH therapies help them treat their addiction (*"And then the OUD patients aren't really going to be interested in that because they don't have—their narrative is I have this addiction and I want to kind of kick this habit and it's just really, just the physical pain of going through withdrawal that I don't want to go through. And so I think they'd be less likely to be like, yeah, how's yoga and how's massage and how's chiropractor going to help me during that one week or so period that it's going to be you really, really, really, really bad."*). Multiple providers also said Veterans with OUD are more unstable mentally and socially than those with just chronic pain, which makes getting them to use CIH therapies more challenging task. (*You know, I mean I guess one thing I might say it's just like severity of their symptoms. Patients with OUD have more severe mental health symptoms and have a harder time following through."*).

Veterans interviewed for this study had positive attitudes towards incorporating CIH therapies into their treatment plans for chronic pain or OUD. (*Like that's where I believe that the actual answer lies. It's not just one thing, it's a combination of multiple things that are going to address what's wrong with you."*). They did not express fears about medication potentially being taken away or instability as factors that would prevent them from using CIH therapies.

## **Theme 2: System Context for Accessing CIH Therapies Through the VA**

### **Availability**

Multiple providers noted a limited capacity for CIH therapies within their respective VAMCs (*Depends how you'd define available. So we have a lot available, just not available to a lot of people."*). Additionally, multiple providers at most sites indicated they did not know what was available at their VAMCs. Several providers also noted that their VAMCS lacked a central directory of CIH therapies for referring patients (*There's not, we don't have a central, like a*

*central menu of everything that's available, how you get your person in, who are the contact people, when is it.”).*

Most Veterans interviewed did not comment on availability within their VAMCs. One Veteran noted that he would like to see more availability in VA clinics near his house (*“Now, if the VA had, you know, a yoga program let's say at some of their clinics that are closer to my house, I mean, I would definitely go to those because if I could not to have, you know, spend the money and go to a VA provided program that would be great.”*).

### **Referrals to Community-Based Providers**

Due to limited availability of CIH therapies within the VA, most providers described referring patients to community-based CIH providers. Multiple providers at each VAMC noted the difficulties of the community care referral system. The primary difficulties noted include: 1) it takes a long time from when a referral is generated to when a patient is seen (*“I think sometimes Veterans think that the community is going to be able to see them a lot sooner than we can and then nothing happens and they come back to us and they kind of complain”*); 2) it is hard for Veterans and providers to understand the community-care referral system (*“I've been here since February of last year, so right around a year and a half and how community care works is still like a mystery to me.”*); 3) the system requires persistence on the part of the Veterans to follow-up (e.g., Veterans have to initiate the appointment in the community and the coordination of who tells them which provider they will see in the community is very unclear, even to providers, and requires Veterans being pro-active); 4) Veterans can only get a limited number of CIH therapy appointments per year (e.g., acupuncture once monthly). Veterans did not comment on the community care referral process or on potential differences between using CIH therapies in the community vs. in the VA. A few providers noted that the complicated community care referral system may be challenging for OUD patients in particular to navigate.

## **Leadership Support**

Providers indicated leadership supports expansion of CIH therapies within their VAMCs. However, many providers noted that their VAMCs lacked resources or expertise to build out robust CIH therapy programs, and that leadership has to contend with several other competing priorities (*"I think they're supportive but at the same time I think that given the limited capacities, specifically space constraints here."*).

## **Discussion**

This qualitative study examined factors impacting use of CIH therapies within the VA for Veterans with OUD. We found that Veterans and providers had good knowledge of CIH therapies as effective and important treatment options based on personal experience and recognition of need for multi-modal treatments that include NPIs, particularly for Veterans with chronic pain. As a result, they were generally enthusiastic about integrating CIH therapies into treatment plans as an NPI option for chronic pain.

However, providers had more mixed attitudes towards using CIH therapies for Veterans with OUD. While providers expressed a good understanding of the scientific evidence showing the effectiveness of CIH therapies for chronic pain, they were largely unaware of research showing that use might help to lower use of opioids.<sup>8</sup> Multiple providers noted that Veterans with OUD are more resistant due to fears that their medication might be taken away and that the CIH therapies would not serve as a good substitute for pain relief. This fear has been noted in previous literature among Veterans with chronic pain but not necessarily OUD.<sup>9</sup> Some providers also thought Veterans with OUD were less likely to think CIH therapies would help for their condition. However, Veterans interviewed for this study did not express those fears and largely wanted access to these therapies. Additionally, Some providers also indicated that Veterans with OUD are more unstable mentally and socially than chronic pain patients, claims that are supported in the literature.<sup>1</sup> Greater instability might make it harder for Veterans with OUD to

access and use CIH therapies through the VA. Nonetheless, despite more mixed attitudes towards using CIH therapies for Veterans with OUD, providers overwhelmingly agreed with Veteran sentiment that it is important to have several non-pharmaceutical options available as a treatment option.

While providers and Veterans had good knowledge and relatively positive attitudes toward using CIH therapies - perhaps in part due to recent reforms aimed at integrating CIH therapies into standard care - many system-level factors negatively impacting use were noted. The main challenges mentioned by providers included lack of availability and absence of central directory showing availability of CIH therapies within VAMCs. Some providers felt that VAMCs lack committed resources to build infrastructure that supports robust internal CIH therapy programs, even as the VA was engaged in implementation efforts aimed at expanding access. Several providers also noted the challenges with the community care referral system, noting the slowness, bureaucracy, and limits on number appointments as barriers to care. While these system level problems create barriers to use for all Veterans within the VA, they may make it particularly challenging for the OUD population.

For the VA and other health systems, findings from this study have policy implications. Because there may be special challenges related to getting patients with OUD to use CIH therapies, providers may benefit from learning patient-centered approaches that consider the unique circumstances and needs of the population. Additionally, within the VA, making it easier for providers and Veterans to use CIH therapies could help facilitate shifts in care away from medication only approaches. Within the VA, creating up-to-date central directories and easing the referral process (both within VAMCs and the community) are the main improvements that would make it easier to use CIH therapies, according to providers interviewed for this study.

Future research should examine effectiveness of CIH therapies for OUD patients specifically. Future research might also look more closely at factors that facilitate shifts in care away from medication only approaches for providers and OUD patients.

### *Strengths and Limitations*

The primary strength of this study is the large diverse sample which included perspective from Veterans and a diverse array of providers. The primary limitations relate to the representativeness of the sample. Both Veterans and providers in the study were more likely to have had experience with CIH therapies than the average provider or Veteran. Also, the sample only included Veterans in one region of the VA (only Southern California, Arizona), so these findings are not representative of the VA as a whole. Last, the sample was limited to VA, so it is not representative of perspectives outside the VA.

### **Conclusions**

Veterans with OUD and their providers were enthusiastic about integrating CIH therapies into treatment plans as an NPI option, particularly for chronic pain. However, providers noted unique challenges impacting use of CIH therapies for Veterans with OUD, which included perceived mental and social instability of the population and concerns by Veterans with OUD that CIH therapies would not help their condition and may be used to supplant pain medication. As a result, system level deficiencies, such as lack of availability or central directories, might have disproportionate impact on Veterans with OUD as it pertains to use. Providers may benefit from learning patient-centered approaches to offering CIH therapies to Veterans with OUD as part of a comprehensive pain treatment plan.

**CHAPTER 4:** Appendix

Figure 1. Coding Manual

Provider (P) and Veteran (V) interviews

Code	P	V	Definition/Desired Content (incl. when to use and not to use)
<b>A. Knowledge, attitudes, and beliefs about CIH</b>			
A1. Evidence about CIH effectiveness	X	X	Knowledge of scientific evidence supporting use of CIH for chronic pain (does not include personal experience)
A2. Prior experience with CIH	X	X	Knowledge about CIH based on prior use (for providers, this pertains to their patients using CIH)
A3. Openness to CIH	X	X	Mention of providers and Veterans being open to using CIH therapies (in the case of providers, this means having their patients use)
A4. Have attitudes towards CIH shifted over time?	X	X	Mention of an attitude shift towards CIH over time (does not include attitude shifts as a result of this intervention)
A5. CIH as a non-medication option/shift from opioids	X	X	Mention of CIH as a non-medication treatment option for pain/ODD
<b>B. Types of CIH</b>			
B1. Acupuncture, chiropractic, massage	X	X	Mention of acupuncture or chiropractic care or massage therapies
B2. Other CIH therapies	X	X	Mention of CIH therapies not in B1
<b>C. System/organizational context</b>			
C1. VA	X	X	Mention of system/organizational factors related to using CIH within the VA (e.g. referring within the VA, access/availability within the VA, leadership/organizational support for CIH use, etc.)
C2. Community Care	X	X	Mention of system/organizational factors related to using CIH within the community (e.g. referring to the community, care coordination, prior authorizations, etc.)
<b>D. Barriers</b>			
<b>E. Facilitators</b>			
<b>F. Interesting Quotes</b>			
<b>G. Flag for discussion</b>			



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## **CHAPTER 5: Discussion**

### **Summary of Dissertation**

In the last decade, the VA has implemented several organizational changes aimed at expanding access and use of CIH therapies for Veterans enrolled in the VA.<sup>1-4</sup> Veterans with chronic pain were particularly targeted by these reforms as they make up a large proportion of Veterans receiving care at the VA and they stand to benefit significantly based on available research.<sup>5-7</sup> This dissertation examined use of CIH therapies (among Veterans with chronic pain) and adoption (by VAMCs) during a time the VA was investing substantially in increasing provision as part of standard medical care. Informed by Rogers Diffusion of Innovation and Greenhalgh's Theoretical Model of Dissemination and Implementation of Healthcare Innovations theories, I assessed multilevel factors (patient-, provider-, and system-level) that might influence use of CIH therapies through the VA.

Paper one used national VA data from the VA Complementary and Integrative Health Evaluation Center (PI: Taylor) to create a profile of Veterans with chronic musculoskeletal pain who are users of CIH therapies through the VA and tested the impact of VAMC participation in the three-year Whole Health System Flagship pilot initiative on users over time. It found that just over one in ten Veterans with chronic musculoskeletal pain are users of CIH therapies through the VA, there are very few users of most CIH therapies (<2%), and that during a three-year period in which the VA was engaged in implementation efforts to expand provisions of CIH therapies, the percent of users increased a modest 20%, with significantly larger increases seen in Flagship VAMCs.

Paper two examined VAMC-level variation related to the provision VA-based and community-based CIH therapy visits and investigated organizational characteristics associated with use of VA-based CIH therapies. It found wide variation in how much VA-based care was provided by VAMCs, with some facilities relying almost exclusively on community-based providers and others providing most services in-house. A key finding from this study was that

VAMCs offering the fewest number of VA-based CIH therapies provided the least amount of total care in-house but did not provide less care overall because they were outsourcing so much to the community. While it is a positive sign that VAMCs without robust internal CIH therapy options are utilizing community-based providers in terms of accessing CIH therapies, there are cost and care implications for the VA to consider.

Finally, Paper 3 drew on qualitative interview data with providers and Veterans in five VAMCs to identify patient, provider, and system-level factors affecting CIH use by Veterans with OUD. Veterans with OUD are a distinct sub-population that includes Veterans with high levels of chronic pain.<sup>8</sup> Findings show that in general, providers are knowledgeable about use of CIH therapies to treat chronic pain, but not about use of these therapies for treatment of Veterans with OUD. This paper also found that Veterans with OUD and their providers were enthusiastic about integrating CIH therapies into treatment plans as an NPI option, particularly for chronic pain. However, providers noted unique challenges impacting use of CIH therapies for Veterans with OUD, which included perceived mental and social instability of the population and concerns by Veterans with OUD that CIH therapies would not help their condition and may be used to supplant pain medication.

### **Key Takeaways**

There are several key takeaways from this dissertation. First, user rates of CIH therapies through the VA is currently relatively low among Veterans with chronic musculoskeletal pain, suggesting continued room for improvement. As shown in Paper 1, only 13.3% percent of Veterans with chronic musculoskeletal pain used a CIH therapy through the VA in FY 2019. While other studies have found that many Veterans also report using CIH therapies on their own in the community<sup>9</sup> (i.e., not paid for by the VA), many CIH therapies are not readily accessible in a community setting (e.g. biofeedback, guided imagery) and/or may be cost prohibitive for many Veterans, who are disproportionately disadvantaged socioeconomically.<sup>10</sup> Increased

access to CIH is an important component of the VA's vision for the Whole Health System model of care, which aims to improve patient-centered care within the VA by integrating Veteran goal driven personal health planning with conventional and non-conventional care; study findings suggest that continued investment in increasing CIH uptake are still needed.

However, while overall CIH therapy user rates remain relatively low, the changes from pre-implementation to two years into WHS implementation represent significant progress for the VA. Considering the size of the VA (over 9 million enrollees), even small increases in user rates translates to tens of thousands more users of CIH therapies through the VA. The VA is an extremely large, decentralized system with limited resources and a multitude of competing priorities; as a result, transforming care within the system and increasing capacity to provide new types of care is expected to be a slow, arduous process. Within the VA, space is limited to offer CIH therapies hiring CIH therapy providers is difficult and may take a long period of time. It could also take years to change ingrained behaviors of providers and Veterans that favor medication only approaches to care. Fortunately, findings from this study show that transformation towards care that incorporates more CIH therapy care is occurring, particularly in Flagship VAMCs. While it may take several more years for the VA to realize their vision of a Whole Health System model of care, early results are promising.

Third, results showed that efforts by VA to expand access to CIH therapies by actively disseminating and providing VAMCs with dedicated resources were generally positive but inconclusive. In paper 2, it was found that VAMCs receiving Whole Health System grants did not provide more care or more VA-based care than VAMCs not receiving the grants. Flagship VAMCs, which received substantial dedicated resources and more active dissemination of CIH therapies, saw modestly greater gains in users but did not offer more visits overall or a higher percentage of care in the VA than non-flagship VAMCs. However, Paper 1 and 2 showed that use and adoption are occurring at a faster rate in Flagship VAMCs, particularly during the 2<sup>nd</sup> year of the Whole Health System pilot initiative. While it can't be casually claimed that this is the

result of the Flagship pilot due to selection bias (i.e., Flagship VAMCs may be fundamentally different than non-Flagship VAMCs), it does suggest that Flagship VAMCs were responsive to the resources and dissemination being provided by VA leadership and administration.

Fourth, in addition to the focus on getting Veterans and VAMCs to become users and adopters of CIH therapies, the VA (and other health systems) should carefully consider the composition of CIH therapies available and accessible, both in terms of types of therapies and where they can be accessed (i.e., in the VA or through community-based providers). Paper one showed very low usage of psychological therapies (such as yoga and meditation). These therapies may provide different benefits than the physical therapies (e.g. acupuncture, chiropractic care) much more commonly used by Veterans through the VA (e.g., yoga and meditation necessitate patient engagement and learning of techniques that patients can use on their own to improve their health). Paper two showed that the bulk of CIH therapy care is occurring in via VA-funded community care provider, which only includes acupuncture, chiropractic care, and therapeutic massage, and some VAMCs use refer to community care at very high rates. Research suggests non-CIH therapy community care is lower quality on average.<sup>11-13</sup> Additionally, as found in paper three, the community care referral system is administratively burdensome, which may make it harder for Veterans to access, particularly those with those with more complex social and mental health needs, to access.

Fifth, use and uptake of CIH therapies varies considerably across patient populations, including by types of health conditions, which deserves special consideration by the VA and other health systems trying to integrate CIH therapies into standard care. For example, paper three found that Veterans with OUD face unique barriers to accessing CIH therapies compared to Veterans with chronic pain due to more severe mental health and social problems. The lack of availability and centralized offerings of CIH therapies within VAMCs combined with the



administrative challenges associated with accessing community care may make it particularly challenging for this population to use CIH therapies through the VA.

### **Policy implications**

There are policy implications for the VA, other health systems, and policy makers based on findings from this study. For the VA, dedicated resources and active dissemination provided to Flagship VAMCs appeared to be an important ingredient to improving use among Veterans and adoption in VAMCs. While the Flagship program was a one-off funding source for select VAMCs, continued financial and technical support in some capacity should be considered. The VA might target VAMCs heavily relying on community care. They could do this by leveraging the knowledge and experience gained by Flagship VAMCs to help non-Flagship VAMCs. The VA should also consider expanding what community care pays for to include things like yoga and tai chi, as it may not be feasible for some VAMCs to offer many of these therapies due to limited resources. Additionally, providers may benefit from learning patient-centered approaches (e.g., tailored educational approaches to providers on how to talk to Veterans with OUD about using CIH therapies) to offering CIH therapies to Veterans with OUD and other complex subpopulations.

For both the VA and other health systems, this dissertation can help organizational leaders and policy makers set realistic expectations around use and adoption of CIH therapies within a conventional healthcare system. This includes understanding that use is likely to be low (and very low for some subpopulations), and that it might take substantial time and effort to see meaningful changes. For CIH therapies, patients and providers require time to learn, adjust, and incorporate a different approach to medicine than they are used to. Substantive system level changes (e.g., increasing availability, educating providers and patients, changing incentives for providers, improving buy-in from clinic leaders, etc.) also need to occur to support providers and patients transitioning to a different model of care. Thus, it is important that

conventional health systems incorporating CIH therapies into standard care facilitate use for patient and providers rather than create barriers, which is likely to discourage providers and patients from changing behaviors. Health system leaders should also have patience as they transition to models of care that include use of CIH therapies, as results will not be evident right away but may pay off greatly in the long term in terms of population health (e.g., lower rates of obesity, better control of chronic conditions, improved mental health) and health care costs.

For the VA, health systems, and policy makers, this work points to more research needed to understand factors impacting use of CIH therapies and real-world outcomes from a health system integrating CIH therapies into standard care. Qualitative research could help better elucidate understanding of behavioral factors impacting willingness of providers and patients to use CIH therapies. More research is also needed on how integration of CIH therapies within conventional health care systems impacts population health metrics, such as prevalence of chronic pain or use of opioids. Changes in health care costs and return on investment for health systems integrating CIH therapies also need to be better understood. For the VA specifically, more research is needed on factors impacting adoption of CIH therapies within VAMCs, differences in population-level outcomes in Flagship and non-Flagship VAMCs, and cost and quality comparisons for VA and community-based care.

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