Published in final edited form as:

J Subst Abuse Treat. 2014 March ; 46(3): 390–401. doi:10.1016/j.jsat.2013.09.002.

“The chief of the services is very enthusiastic about it”: A qualitative study of the adoption of buprenorphine for opioid addiction treatment

Carla A. Green, PhD, MPH^a, Dennis McCarty, PhD^b, Jennifer Mertens, PhD^c, Frances L. Lynch, PhD^d, Anadam Hilde, MD, MPH^e, Alison Firemark, MA, LPC^d, Constance M. Weisner, DrPH, MSW^c, David Pating, MD^f, and Bradley M. Anderson, MD^g

Carla A. Green: carla.a.green@kpchr.org; Dennis McCarty: mccartyd@ohsu.edu; Jennifer Mertens: jennifer.mertens@kp.org; Frances L. Lynch: frances.lynch@kpchr.org; Anadam Hilde: hildea@dop.hawaii.edu; Alison Firemark: alison.j.firemark@kpchr.org; Constance M. Weisner: constance.weisner@kp.org; David Pating: david.pating@kp.org; Bradley M. Anderson: bradley.m.anderson@kp.org

^bDept. of Public Health & Preventive Medicine, Oregon Health & Science University; 3181 S.W. Sam Jackson Hill Road, CB 669, Portland, OR 97239

^cKaiser Permanente Division of Research, 2000 Broadway, Oakland, CA 94612

^dKaiser Permanente Center for Health Research; 3800 N. Interstate Avenue, Portland, OR 97227-1110

^eUniversity of Hawaii, Dept. of Psychiatry, 1356 Lusitana Ave, 4th floor, Honolulu, HI 96813

^fKaiser Permanente Chemical Dependency Recovery Program 1201 Fillmore Street San Francisco, CA 94115

^gKaiser Permanente Northwest, Addiction Medicine Department, 3550 N. Interstate Avenue, Portland, OR 97227-1097

Abstract

Qualified physicians may prescribe buprenorphine to treat opioid dependence, but medication use remains controversial. We examined adoption of buprenorphine in two not-for-profit integrated health plans, over time, completing 101 semi-structured interviews with clinicians and clinician-administrators from primary and specialty care. Transcripts were reviewed, coded, and analyzed. A strong leader championing the new treatment was critical for adoption in both health plans. Once clinicians began using buprenorphine, patients' and other clinicians' experiences affected decisions more than did the champion. With experience, protocols developed to manage unsuccessful patients and changed to support maintenance rather than detoxification. Diffusion outside addiction and mental health settings was nonexistent; primary care clinicians cited scope-of-practice issues and referred patients to specialty care. With greater diffusion came questions about long-term use and safety. Recognizing how implementation processes develop may suggest where, when, and how to best expend resources to increase adoption of such treatments.

© 2013 Elsevier Inc. All rights reserved.

^aCorresponding Author; Kaiser Permanente Center for Health Research; 3800 N. Interstate Avenue, Portland, OR 97227-1110.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Keywords

Diffusion of technology; buprenorphine; opioid addiction; qualitative research; medication adoption; implementation research

1. Introduction

The Drug Addiction Treatment Act of 2000 (DATA 2000) authorized qualified physicians to request a waiver to use schedule III, IV or V medications (with Food and Drug Administration [FDA] approval) for the treatment of opioid dependence. In 2002, the FDA approved two formulations of buprenorphine hydrochloride (buprenorphine) as Schedule 3 controlled medications: buprenorphine alone (Subutex®) and buprenorphine plus naloxone (Suboxone®). Both may be prescribed in office-based settings by physicians who complete eight hours of training in treating opioid use disorders and register with the Center for Substance Abuse Treatment (Substance Abuse and Mental Health Services Administration, 2012a). The enabling legislation initially capped the number of patients at 30 per physician group, significantly restricting use of buprenorphine in large health systems. Amendments raised the limit to 30 patients per physician and later to 100 patients per physician (after one year's experience and a request for permission). Physicians in a variety of office-based settings, including specialty addiction treatment and primary care settings, can now treat patients using agonist therapy.

1.1 Adoption of Buprenorphine for Treatment of Opioid Dependence

Use of buprenorphine to treat opioid dependence remains uncommon. About one in five (19.6%) of 13,720 specialty addiction treatment centers responding to the 2011 National Survey of Substance Abuse Treatment Services reported use of buprenorphine (Substance Abuse and Mental Health Services Administration, 2012b). Similarly, less than 10% of psychiatrists who were not addiction specialists reported writing buprenorphine prescriptions (Thomas et al., 2008). Limited implementation of buprenorphine suggests the importance of studying its adoption in real-world practice and health care settings.

Qualitative and survey studies have identified several factors that influence willingness to adopt buprenorphine. Treatment programs with more access to information, and clinicians who seek information about medication (i.e. members of provider associations, who use the National Institute on Drug Abuse's website, or talk to resource linkages like pharmaceutical company detailing), are more likely to be early adopters (Savage, Abraham, Knudsen, Rothrauff, & Roman, 2012). In addition, clinician training enhances diffusion of new pharmacotherapies for addiction treatment (Abraham, Ducharme, & Roman, 2009; Thomas et al., 2008), while perceived social norms have more influence on clinicians' intentions to recommend buprenorphine than their attitudes toward use of medications (Rieckmann, Daley, Fuller, Thomas, & McCarty, 2007). Physicians with fewer years treating addictions are more likely to prescribe buprenorphine for detoxification than maintenance, while those who prescribe buprenorphine for maintenance are less likely to prescribe it for detoxification (Reif, Thomas, & Wallack, 2007). Institutional support also promotes use of buprenorphine, while a lack of financing and limited practitioner knowledge about the medication inhibits prescriptions (Thomas et al., 2008). Not surprisingly, lack of institutional support (e.g., office and nursing support) and pharmacy-related problems create barriers to adoption (Walley et al., 2008).

Positive attitudes toward medications for addiction treatment appear to be a necessary, though not sufficient, condition for adoption of buprenorphine (Wallack, Thomas, Martin, Chilingerian, & Reif, 2010). Professionalism in the workforce, hospital settings, and

certified and licensed counselors increased adoption (Knudsen, Roman, Ducharme, & Johnson, 2005), while exclusions of coverage for addiction treatment medications and higher cost sharing of medications when they are covered, impede adoption (Horgan, Reif, Hodgkin, Garnick, & Merrick, 2007). In brief, existing research suggests that organizational, practitioner, financing, and characteristics of the medication appear to affect adoption and implementation of buprenorphine for treatment of opioid dependence.

1.2 Implementation Research

The Consolidated Framework for Implementation Research (CFIR) is consistent with, and builds upon, Rogers' (2003) work on diffusion of innovation. It comprises factors Rogers identified as important to adoption, including the ways in which the characteristics of the innovation interact with those of its adopters and non-adopters, the environment in which adoption is taking place, and the roles played by social networks in the adoption and implementation process. The CFIR further elucidates the complexity of the implementation process within five domains: intervention characteristics, outer setting, inner setting, characteristics of individuals, and process (Damschroder et al., 2009; Damschroder & Hagedorn, 2011). Intervention characteristics expand Rogers' (Rogers, 2003) attributes of the innovation (relative advantage, adaptability, trialability, and complexity) to include the source of the intervention, strength of evidence, design quality, and cost. The outer setting considers patient needs, cosmopolitanism, peer pressure, and external policies and incentives. Five dimensions contribute to the inner setting: structure, networks and communication, culture, implementation climate (e.g., tension for change, compatibility, relative priority) and readiness for implementation (i.e., leadership engagement, resources, and access to knowledge). Individual characteristics address knowledge, self-efficacy, stage of change, and other personal attributes. Finally, the implementation process requires planning, engaging (i.e., opinion leaders, champions, external change agents), executing, reflection, and evaluation (Damschroder et al., 2009; Damschroder & Hagedorn, 2011).

The complexity of implementation sets the context for our work examining the process of adopting buprenorphine within two integrated health plans. Data from electronic health records documented that the health plans varied in the pace and scope of adoption (Lynch et al., 2013). The percent of patients with opioid dependence that were prescribed buprenorphine increased from 7% in 2003 to 20% in 2005 to 35% in 2008 in one health system. In the second, implementation was slower to start, but the percent of patients with buprenorphine prescriptions increased from 2% in 2003 to 3% in 2005 to 28% in 2008. Differences across these systems in (a) previous experience with agonist therapy (one had no prior experience and the other routinely covered methadone maintenance), and (b) size (one was substantially larger and more complex), make these systems useful environments in which to assess adoption of agonist medication within integrated care settings. Our goal is to inform policy and implementation strategies to support and promote greater utilization of new evidence-based addiction treatments. Interviews with clinicians and clinician-administrators during rollout of buprenorphine in the two health plans provide insights into differences in organizational supports, practitioner attitudes, and perceived costs and benefits of buprenorphine. Differences in the size and structure of the organizations, as well as the way care was delivered and organized, provided opportunities to identify common elements necessary for facilitating adoption.

2. Materials and Methods

We conducted 101 semi-structured interviews with clinicians and clinician-administrators, recruited from a wide range of departments, in order to elucidate variations and commonalities in implementation across the two health plans.

2.1 Study Settings

Two not-for-profit prepaid group-model integrated health plans provided the study setting: Kaiser Permanente Northwest (KPNW) and Kaiser Permanente Northern California (KPNC). KPNW serves about 500,000 members in Northwest Oregon and Southwest Washington State. KPNC serves about 3.2 million members in Northern California's San Francisco Bay and Central Valley Regions. The KPNW and KPNC Institutional Review Boards (IRBs) for the Protection of Human Subjects reviewed, approved and monitored the study. All interview participants agreed to have their interviews recorded, provided informed consent, and signed IRB-approved consent forms.

2.2 Specialty Treatment for Substance Use Disorders

Addiction Treatment, KPNW—Individuals who present with problems related to opioids undergo a medical assessment and history to assess appropriate level of care and develop a treatment plan. Agonist therapy may be provided based on the assessment and client preferences. All patients dependent on opioids are encouraged to attend psychosocial counseling sessions; those taking buprenorphine are typically required to attend such sessions during early phases of treatment or risk losing prescriptions. Buprenorphine treatment is available through the health plan's Addiction Medicine Department; methadone maintenance is available through contracts with licensed methadone programs. Patients receiving buprenorphine treatment are required to have case management and to sign a treatment agreement with expectations for patient adherence to the treatment plan, including frequent, random, urine drug screens. Each request for a medication refill generates a chart review to assess compliance with counseling treatment and prescriptions for contraindicated medications (e.g., other opioids or benzodiazepines). Case managers work with non-adherent patients to increase engagement and support efforts to improve adherence. If efforts fail, prescriptions are not refilled.

Addiction Treatment, KPNC—KPNC provides a variety of treatment programs for individuals with opioid and other chemical dependency problems. Treatment options include day hospital treatment, traditional outpatient treatment and, when appropriate, residential treatment (through contracted services). Rehabilitation treatment generally lasts 8 weeks, with 10 months of aftercare available. Group-based treatment includes supportive therapy, education, relapse prevention and family-oriented therapy. Individual counseling is available as needed. In most facilities, patients using buprenorphine participate in a larger group-based program, and within that program attend buprenorphine-specific groups. Patients attend 12-step meetings off site and receive random breathalyzer and urine screens throughout the treatment program.

2.3 Practitioner Interviews

KPNW has 11 clinics with addiction medicine programs and one inpatient facility providing treatment for addiction, mental health, and co-occurring disorders. We sampled addiction medicine clinicians from all of these facilities; clinicians from other departments were sampled across all clinics in the health plan. In KPNC, we selected five of 27 Chemical Dependency Programs to maximize geographic and socioeconomic diversity, including both urban and suburban locations in the Central Valley and Bay Area. We also included facilities with larger and smaller Chemical Dependency departments.

To select potential interviewees, we asked the Chiefs of Addiction Medicine/Chemical Dependency Departments to provide us with lists of clinicians providing treatment to significant numbers of patients with opioid addictions. We used information from electronic medical records to identify clinicians in departments other than addiction medicine/chemical dependency who provided care for patients with opioid dependence, selecting those with the

largest number of patients on their caseloads first, followed by those with fewer patients. In addition to oversampling addiction medicine/chemical dependency clinicians, we oversampled clinicians in mental health/psychiatry departments (they were more likely to see patients who also had problems with opioids), and clinicians in pain clinics (they see patients with long-term opioid use). We recruited emergency department clinicians because they encounter opioid-seeking patients; pharmacists, because they dispense buprenorphine and other opioids; hospitalists and anesthesiologists because of effects on their practices when patients use an agonist therapy; and adult primary care clinicians because the federal policy regarding buprenorphine was in part intended to increase access to buprenorphine in primary care contexts.

We completed 101 interviews across the two health plans, 49 in KPNW and 52 in KPNC, including 5 re-interviews with key informants, 2 at KPNW and 3 at KPNC. Table 1 shows participants' departmental affiliations.

2.4 Interview Procedures

Recruitment letters signed by service chiefs or chemical dependency clinic directors assured clinicians that participation was voluntary and confidential; a study telephone number and post cards allowed clinicians to indicate interest in participating/unwillingness to participate. After sending recruitment letters, study staff contacted clinicians by e-mail or telephone if clinicians did not respond to the letter. Follow-up contacts referred to the recruitment letter, asked if it had been received, offered to provide more information about the study, discussed confidentiality and what participation would involve. Recruitment letters were sent to 160 clinicians and clinician/administrators; 96 completed interviews (60%); 3.8% ($n = 6$) agreed to be interviewed but were unable to meet the interviewer before recruitment closed, and 36.3% ($n = 58$) refused, either actively or by not responding to the letter or follow-up attempts. There was no indication that any clinician felt coerced; interviewers were careful to make clear that participation or non-participation, and data collected, were confidential.

Interviews were generally completed in clinicians' offices, or nearby conference rooms, and were typically about an hour long. Interviewers used an interview guide that included general and specific questions about adoption of buprenorphine, organized around theories of diffusion of innovation (see Figure 1). All interviews were audio-recorded in accordance with IRB-approved protocols, then transcribed verbatim with identifying information removed. We encountered few problems conducting interviews, although a few interviews were interrupted because of patient or staff needs. If the clinician did not have time to finish the interview, we scheduled a second appointment to complete it.

2.5 Qualitative Analyses

Using a coding scheme and analyses informed by existing models of adoption of new pharmacotherapies and classical diffusion theory, now consolidated in the CFIR framework (Thomas, Wallack, Lee, McCarty, & Swift, 2003; Thomas & McCarty, 2004; Rogers, 2003; Damschroder et al., 2009; Damschroder & Hagedorn, 2011), we examined clinician and administrator perspectives regarding the roles of patient, clinician, organizational, system and technological characteristics in influencing organizational acceptance of pharmaceutical treatments for addiction. Study investigators and interviewers reviewed transcripts weekly throughout data collection to ensure transcript accuracy and appropriate interviewing, and to develop a coding scheme. The scheme included codes derived from models of adoption of new addiction pharmacotherapies as well as diffusion theory (Thomas et al., 2003; Thomas & McCarty, 2004; Rogers, 2003) and codes created to describe emergent content.

To develop the coding scheme, staff reviewed the same 10 transcripts line by line, making marginal notes regarding possible names for codes that described concepts, themes, or important ideas found in each interview. The team then met, discussed the possible code names and corresponding definitions, and then moved to a new set of transcripts, testing and refining the coding scheme and definitions. When the codes were finalized, interviews were coded using the software program Atlas.ti (Friese, 2011). We used weekly meetings to review coded text and resolve discrepancies and improve code definitions. We completed check coding throughout this process to improve coder consistency; the team discussed and resolved inconsistencies. Of 346 coded passages checked, primary coders were deemed correct 76.2% of the time. Given the heterogeneity among clinicians sampled in terms of their experiences with opioid-dependent patients, and their different training and primary focus (e.g., from surgeons to primary care clinicians to addiction and pain treatment specialists), inconsistencies in coding most often resulted from text applicable to chronic pain patients taking opioids rather than individuals who had opioid-addiction problems. In the end, we coded these responses as best we could (since they were related, but tangential to, study goals). Unless text included information applicable to addiction treatment or patients with addiction problems, we did not use these passages in analyses presented here.

When coding was complete, we generated queries for specific codes and assigned sections of each query to each member of the analysis team. Each team member generated reports of common themes from the text reviewed, including examples of text supporting each theme, contrary examples, and notes and memos about interesting or important content. We describe interview themes (organized by CFIR domains) and note findings that support, depart from, expand, and interact with diffusion theories. Quotes were chosen because they provided clear or particularly informative illustrations of identified themes. We occasionally include longer sections of text to illustrate subtleties or complexities.

3. Results

The CFIR's five domains (intervention characteristics, outer setting, inner setting, individual characteristics, and process) identify variables and dimensions that affect implementation. Clinician (individual) characteristics interact with organization and system characteristics (inner setting) to affect organizational acceptance. The qualitative analysis presented here sorted quotations into themes that reflect CFIR domains. The analysis begins with an overview of the implementation process, examines organizational and system influences from the inner setting, then describes the intervention, practitioner and patient characteristics that affected implementation.

3.1 Process Domain: Organizational and Clinician Acceptance

Clinician, organizational and system characteristics combined with characteristics of the medication to affect acceptance of buprenorphine at the organizational and practitioner levels. In both health systems, clinical leadership provided the key impetus for organizational change, then facilitated implementation and practitioner acceptance of agonist medication for the treatment of opioid dependence.

Champions—A strong champion for buprenorphine played a critical role in each organization's decision to adopt and promote use of the medication. Champions introduced the technology and worked to change clinician, organization, and system characteristics to promote use of the medication. Clinical leaders pushed to add buprenorphine to health plans' formularies early on, thus making it available. They organized trainings for prescribing and other clinicians, developed plans for roll-out that changed service capacity and facilities, and worked with clinicians to promote acceptance of buprenorphine's use. One participant described the importance of this latter process:

Well, the chief of the service is very enthusiastic about it and so, therefore, it affects me in the sense that I feel completely free to use it A LOT, you know, as much as we can.

The speed of initial adoption by the organizations, and broad use among clinicians, was clearly tied to the presence and advocacy of clinical leadership. A clinical champion with experience using buprenorphine was present within the smaller health plan (KPNW) and adoption proceeded quickly in that system. Use of buprenorphine was nearly non-existent in the larger health plan (KPNC) until a clinical champion came to the fore and advocated for its adoption and necessary clinical supports.

Once clinicians began to use buprenorphine, however, their experiences with clinical outcomes among their own patients, combined with what they heard about their colleagues' experiences, became more important to their decisions about continuing to use the medication than did information and promotion by the clinical champion. For example:

He's [chief of service] the first one that mentioned it...he found this to be a wonderful drug, for especially doing detox, [and then] every patient I had that went through...that withdrawal, they were just like, whoa. You know, it was humane...

Clinician Acceptance—Once the medication was adopted by the health plans, encouraged by clinical champions, and rolled out, the influence of published research and peer norms and experiences became apparent.

Well, it started showing up in the literature and then...as soon as it was authorized in this country, and...we had in-services on it and we read about it. And then [my colleague], I think got a [grant] award. So she's sort of one of the Suboxone experts.

Clinicians often heard about the medication first through the professional literature, then learned more about it from leaders/champions, then began to have their own experiences and learn from their colleagues' experiences. Irrespective of encouragement, experience with the medication played the most significant role in developing confidence and sustained use of the treatment.

Clinicians' experiences also shaped the ways that the health plans used the medications. Both plans started out using buprenorphine primarily for detoxification, constrained in part by the 30-patient limit per health plan. Experience with failed detoxes, and the increase in the patient limit to 100 patients per prescribing physician, moved both health plans toward maintenance rather than detoxification protocols. Increased movement toward maintenance began to raise questions about appropriate length of treatment and whether medication treatment alone, without behavioral treatment, was enough. These questions remained unresolved for many clinicians.

In sum, clinical champions were critical to adoption of buprenorphine. Champions pushed changes needed to deliver the service and ensured clinician training. Once clinicians became aware of the treatment, they sought out literature about buprenorphine and began recommending it. Patients' and colleagues' experiences led to changes in service delivery and approach, and affected willingness to continue using the treatment.

3.2 Inner Setting Domain: Organization and System Characteristics

Organizational-level characteristics affecting adoption of new addiction treatment technologies include treatment orientation, structure and financing, focus of the organization, patient base, rules, and policies. One respondent provided an example of how these multiple factors interacted to affect adoption:

We didn't have opioid maintenance. If we had a program that had opioid maintenance, adding buprenorphine might not be that big a deal. It's just a matter of taking the training, but we had to...accept the constant opioid maintenance and then we also had to train to learn how to use buprenorphine...our basic contract... says "methadone for the specific purpose of opioid maintenance...is excluded." So, it's [methadone] not covered. We...said there's medical costs [that can be saved] because of the risk of Hep C and HIV [but there was the risk of adverse selection... No other insurer [in the area] has methadone...and there was concern that we would] get all the methadone patients.

This quote eloquently illustrates the reasons for equalizing treatment availability across health plans/insurers to spread risk related to more expensive patients. The Mental Health Parity and Addiction Equity Act and the Affordable Care Act include efforts designed to address such adverse selection problems and spread risk equally (Barry & Huskamp, 2011; Buck, 2011).

Three additional organizational themes (chronic care orientation, clinician backup and patient base) influenced adoption, particularly during the earliest phases. Structural and communication issues needed resolution for effective implementation.

Chronic care orientation—When asked about reasons for not prescribing buprenorphine, some participants reflected on the need to develop and implement a chronic care structure that included case management for patients taking buprenorphine:

I think the biggest drawback to us doing any of that [prescribing buprenorphine] is that we're not following them with long-term care...

Clinician Backup—Several clinicians raised concerns about how to manage patients during vacations and time off if they were the sole certified clinician in a clinic. Clinicians also valued having trained colleagues who could serve as consultants. The lack of colleagues who could serve in both of these roles represented significant barriers to adoption:

...and the availability of other clinicians in the clinic who could prescribe the medication as well...It makes it easier. Because what happens when you're [away]?

Structural and Communications Issues—Participating clinicians identified several system-level characteristics they felt were important in making decisions about adopting or recommending buprenorphine. The complexity of the induction process and development of systems to communicate and supply the medication were early implementation concerns.

The Induction Process—A barrier to adoption was developing the systems required to manage induction — a process that requires the patient to be experiencing withdrawal symptoms, followed by administration, observation and titration of the medication over a period of several hours to as much as two days.

...with buprenorphine you really have to be very careful with the first time the patient is dosed...And you really do need to observe them for a while afterwards. So this is not something I can do in the clinic, especially when I see patients back to back. If there is that capability in the clinic, if there is a treatment team, if there is a concurrent substance group where the patient can get more frequent follow-up, I would be more comfortable.

Another barrier was the lack of availability of the medication in the clinic itself, and the costs associated with maintaining such a supply. For example:

One issue right now...is whether or not to get our own supply of [buprenorphine] in our clinic. I think we're moving in that direction. It's just for induction rather than maintenance, but we would have to pay for that out of our [clinic] budget...

Pharmacy access to buprenorphine—Both health plans struggled with medication availability in the early phases of adoption because pharmacies did not have enough demand to stock a regular supply. This resulted in a cumbersome special-order process and caused unexpected problems ranging from delays in refills to lack of availability in hospital settings. The examples below suggest that small populations of patients may require health systems to set up specialized processes for providing rarely prescribed medications:

We had a REALLY hard time with the pharmacy in the first few months of this program because...we dispense it to the patient during the induction period and we had to really jump through hoops and we had a problem with the pharmacy getting the medication here and a lot of misunderstanding...And then when the person is stable on their medication we give them a prescription...and they weren't keeping a supply on hand. So, when someone would go there, we would send the prescription over and send the patient over to pick it up, it had to be special-ordered and it would take 3 to 5 days to get and that was a huge huge problem, and it took a lot of emailing and calling and discussion...so that when the doctor sends the prescription over the patient can pick it up. So, that was a really big problem in the beginning.

Even in the hospital I [would] say, well, let's put you on [buprenorphine]. The pharmacy, gee, we don't have that. We can get it in two or three days. That won't work, so we have the spouse come over here, pick it up and take it to the hospital and get them on it... now [that the pharmacies are expecting demand]...the location is not an issue.

Perceived Roles for Primary Care and Specialty Care—For clinicians in departments other than Addiction Medicine/Chemical Dependency, having access to addiction treatment experts who could manage buprenorphine induction and monitor treatment was very important in considering treatment recommendations. Some primary care clinicians indicated, however, that the availability of the specialty department was also a barrier to wider adoption within the health plans. Other clinicians noted the need to involve primary care physicians in the management of patients with substance use disorders.

[Buprenorphine] can diffuse within the [addiction treatment departments], but to get it to diffuse beyond that, that's the challenge. And that's where it really will have its benefit...Because, there are more people with the problem than can be handled [in addiction treatment settings]. Just as there are more patients with depression than can be managed by the mental health department...addiction becomes a primary care disease...I think primary care clinicians need to take ownership and responsibility for helping their patients with addictions and not simply send them off to the specialty department...

Clinicians also raised concerns about legal limits to the number of patients that can be treated (currently 100 patients/prescribing physician) and having adequate numbers of physicians able to prescribe to address patient needs if the medication was to be offered. Other health plan policies were mentioned as important in promoting adoption of the medication. For example, having the medication on the formulary was seen as particularly important to promoting its use, but interestingly, we heard little about market factors or disease prevalence from clinicians. Exceptions to this were that most clinicians from departments other than addiction medicine/chemical dependency did not feel they had enough patients with opioid dependence to warrant obtaining authorization to prescribe,

while clinicians in addiction medicine/chemical dependency were more likely to consider adopting buprenorphine after receiving requests from patients.

Training—As adoption proceeded, the two health plans diverged in their approaches to training prescribers. In the smaller system, prescribing began and continues to be managed by addiction medicine physicians, and Addiction Medicine has become a primary care department. In the larger system, addiction medicine physicians began prescribing buprenorphine and continue to manage induction, while psychiatrists in the Psychiatry Department manage some long-term maintenance. Psychiatry was chosen because primary care physicians stated that they were too busy to take on buprenorphine management. Both systems' primary care departments viewed chemical dependency and psychiatry settings as more appropriate for treating opioid dependence. In addition, some of the smaller addiction clinics in the larger health plan were already embedded within Psychiatry, thus facilitating this arrangement. In the latter system, the larger chemical dependency departments continue to use addiction medicine physicians to manage buprenorphine maintenance. Thus, similarly organized health plans used quite different methods of diffusing the new technology, in part because of issues related to clinic size and existing co-location.

In sum, a variety of organizational and system characteristics affected adoption. Existing organizational culture and historical coverage for opioid replacement therapies affected willingness to adopt buprenorphine. Once cultural barriers were overcome, a variety of important structural changes had to be worked through — staffing and clinic space had to be identified for induction; medication had to be made available within clinics for induction and then in pharmacies. As adoption proceeded and demand from patients increased, decisions had to be made regarding who would receive training to prescribe, and perceived roles for primary and specialty care affected decisions in both systems, with buprenorphine care provision situated in addiction treatment and/or mental health settings, but not primary care.

3.3 Intervention Characteristics Domain: Characteristics of buprenorphine

Medication cost, the ability to prescribe buprenorphine in an office-based setting, and its known and unknown effects were key features of the medication that affected the implementation process.

Costs and Cost-Effectiveness—The majority of clinicians did not say anything about considering costs of the medication to patients. A few prescribers, however, expressed reluctance to recommend buprenorphine if they felt patients' lack of ability to pay their part of the medication costs would increase risk of relapse. Some opted to recommend methadone maintenance as a cheaper alternative:

All three [of my] present patients on buprenorphine [are] very distraught financially, and one is paying COBRA at huge prices...They cannot pay out of pocket...Another patient who relapsed was doling out her buprenorphine [to make the prescription] last a little longer...she just ended up using somebody else's prescription drugs in their medicine cabinet.

Other clinicians took a tougher approach, suggesting that the costs of not taking the medication (e.g., costs of an illicit habit, risk to health) were greater than that of taking the medication:

Interviewer: What about the costs...the overall costs to the health plan or the patients? Does that figure into your decisions?

Clinician: No, because I'm sure it's cheaper than illicit opiates...if somebody doesn't have a prescription benefit, I encourage them to think about it in terms of risk versus benefit and it's definitely cheaper than...a dollar a milligram on the street [for OxyContin].

When asked about costs to the health plan, the majority of clinicians indicated that costs were not something they considered, indicating that their treatment decisions were based on what the patient needed. For example:

...one of the reasons I came to [the integrated health system] and...stayed is that I can practice medicine WITHOUT having to think about the confines of the insurance plan. In private practice I had to deal with that EVERY SINGLE DAY and it made me CRAZY — plans limiting what medications, whether people could go to the hospital, whether people could go to the emergency room, whether people could even have their blood drawn. I really...have a tremendous luxury...that I very, very seldom have to think about that.

Treatment Settings—Several clinicians mentioned the value of being able to provide buprenorphine in office-based settings where patients feel more comfortable. They also saw the value of patients not having to attend a clinic every day for medications, as is typically the case for patients on methadone maintenance. Others, however, recognized that they had less information about treatment compliance with buprenorphine than with methadone:

One of the good things about methadone is they have to go to the methadone clinic. So, we know right away if they're noncompliant because the methadone clinic lets us know. But on buprenorphine, I don't know if...it would be as easy to make sure that a patient is complying.

Better Detoxification Process, But...—A number of addiction treatment providers mentioned the detoxification process as an advantage of using buprenorphine. Comments sorted into three types: 1) easier detoxification when compared to traditional detoxification from opioids, 2) easier detoxification following maintenance when compared to methadone, and 3) the fact that even if it is an easier detoxification, people risk relapse and it becomes a maintenance medication rather than a short-term taper. The following quotes illustrate these perspectives:

Well, the difference between people who are detoxing on the regular group and the people who are detoxing on the [buprenorphine] seem to be pretty significant as far as their comfort level of detox and their need for ancillary medications...it's usually a pretty well-tolerated...It has the advantage too of being a deterrent to using on top of it, because it can cause withdrawal when an opiate is used on top of [buprenorphine].

Our experience has been very, very good using the buprenorphine for detox...everybody's treatment is individualized. But, for the most part while all these people are detoxing with buprenorphine they're able to go to work, do everything they normally do with minimal withdrawal symptoms.

...once they started using buprenorphine, nobody was interested in the clonidine because it [buprenorphine] was so much smoother [but] some of my colleagues that started...trying it out... [but] stopped because they couldn't get people off. And so it turned into a maintenance.

We also identified additional themes related to the medication itself. Unlike medications for other disorders, the wide range of problems associated with addiction led to concerns that

the medication was *too* efficacious. Clinicians also expressed concerns about lack of information about side-effects and long-term use.

Buprenorphine Works Too Well—Some clinicians were concerned that buprenorphine is so effective that it prevents people from making the life changes they believed necessary to support long-term recovery. For example:

...people get on [buprenorphine] and it works so well that they feel like they're cured. I mean, they really do. They feel, oh! This is great! This medication, no withdrawals and so I can function just fine, and everything. And so sometimes there's no motivation to learn any of the recovery skills or try to develop support... with any recovery, pain, psychic pain, or whatever...provides motivation for people to want to make a change.

Along these lines, some participants raised the question, "Is buprenorphine enough?" That is, if we give patients this medication, it stabilizes their lives to their satisfaction, should that be enough treatment? For example:

That's another philosophical question...because some people would say, well, if they can stay on it for the rest of their life and they're comfortable, what's wrong with that?

... [the] question is, okay well, should they stay on this for the rest of their lives, or should they try to get off of it at some point? And, I'm sort of at the feeling now, it's just kind of up to them...I don't see a need, necessarily, for them to get off of it if it's working for them. But, if you were to ask me that a year ago, I would have given you a different answer. And, I would have said that, no, I think that it's fine for a period of time, but that they should get off it.

Unknown Long-term Effects, Side Effects—Clinicians also expressed concerns about the general lack of knowledge regarding possible long-term effects of taking buprenorphine and the risk of currently unknown side-effects:

... every time a new drug comes out you go, well, what's the experience been two years down the road? Just because [with] so many new drugs, side effects happen...

...we just don't know the long-term effects of the medication. So, I get concerned about that.

In sum, characteristics of the medication had important influences on adoption, some of which became evident later in the adoption process. Costs to the health plans were not particularly salient for most clinicians, though some considered patient costs. The lighter burden of an office-based treatment was important when compared to methadone, as was a more humane detoxification process. The move toward maintenance in both health plans increasingly raised questions about the safety of long-term treatment, and about whether the medication worked so well that individuals were not motivated to make the life changes clinicians felt were necessary for overcoming addiction.

3.4 Clinician Characteristics

Across the two health systems, the availability and effectiveness of opioid agonist therapy challenged physicians and counselors to adjust their attitudes about addiction and addiction recovery. Clinical experience with buprenorphine had a substantial influence. Practitioners also confronted the need for training and to reexamine their scope of practice.

Treatment Orientation and Philosophy of Treatment—Clinicians varied in their treatment orientations and philosophy. Some took a comprehensive approach that included medications as one tool in the treatment toolbox. Others followed approaches that favored abstinence alone, or at least as the first approach to treatment. This clinician saw buprenorphine as one component of a many-faceted treatment approach:

So, we're cheating the patient by not really remembering and focusing on the fact that the non-medicine treatment approaches are just as important or more important...That the psychotherapy, the group therapy, the Twelve Step or community-based support meetings, education...is equally, if not, more important than the [medication].

Clinicians' perspectives were often affected by their attitudes about harm reduction approaches, with those who did not favor harm reduction methods less willing to adopt the medication at all, or as a first step. This example illustrates the latter perspective, suggesting a drug-free approach before trying maintenance:

I think anybody comes in with any type of addiction should not...be offered harm reduction from the *beginning*. It should be a non-using drug-free type of program first of all...drug-free, 12-step, education, group counseling, individual counseling...I think no, that [buprenorphine maintenance] should not be the first approach, it should be the last approach and see if the person can make it in mainline treatment first.

Additional clinician beliefs and attitudes affected approaches to opioid maintenance therapy. Some clinicians voiced concerns that maintenance medication just substituted one addiction for another, prolonging the need to taper off and go through withdrawal. For example:

...you're either going to have to go off and taper off of one or the other. Why prolong the process? It's not like it's giving a high to you. It's not giving you that euphoria. If it's just for physical it seems you're kind of wasted by it...I wouldn't encourage it.

Conversely, those who endorsed harm reduction approaches were more likely to support use of buprenorphine:

...if a person can get off of it and stay clean, that's great. But, if they can't, it's better to be...on opioid replacement and stay clean and out of the whole drug life and the whole risky behavior than it is to be 100% drug free...

Experience with buprenorphine—Several clinicians reported that they were initially very skeptical but changed their minds after seeing the positive impact buprenorphine had on their patients' lives. This practitioner articulated the complexity of clinicians' thinking about, and weighing of options for patients:

...my thinking on this has really changed in the last year...watching what's happened here...when we started, it was a [buprenorphine] detox program...Then, the issue came up about maintenance...I was against that at first. I just had a belief ... that it's just better to get clean and sober, and go through whatever you have to do. But, one of the things that...I've learned is...people do so well on [buprenorphine]. And, they're not high, you know...I've kind of seen what's happened here, I'm kind of a believer now. So, it seems like ...a lot of people are doing really well, who I don't think would have done well under the old system.

A clinician with less positive experiences expressed a different perspective:

...I was *very*, very skeptical that there was going to be a drug that we could give to opioid addicts once a week, once every 2 weeks, once a month and that they would become fully functioning adults who did not have any other problems, who took their buprenorphine and moved back into mainstream life and met all their responsibilities as an adult. I was skeptical of that, but I was willing to wait and see and willing to participate...My experience in the last 6 months has been — people come through the door asking for it, and they too have sort of a magical belief that they're going to be able to take this medication and life is going to be good...And so patients are surprised... [and] angry when it doesn't do that. We in turn have been surprised that they don't stop using other opioids, and they don't stop using cocaine, and they don't stop using marijuana, which in turn makes us angry — makes us frustrated...And so it has been frustrating to try to find what is going to work because patients are not staying for treatment. Patients are not completing detoxes. Patients are not staying abstinent. So, it doesn't really look, yet, a whole lot different than anything else we've tried in the past for opioid addicts, although the detox seems a *little* easier for them, they seem a *little* more comfortable...

Knowledge and Education—Interviews revealed the importance of knowledge and education on the adoption of a new medication, particularly one that has specific training requirements attached to prescribing privileges:

It [education] is huge because I didn't know what it [buprenorphine] was. I knew it was a partial agonist...but it seemed like a huge black box. You know, only certified clinicians can prescribe it. But after I listened to the lecture, I felt like if there is the necessary clinic support it's not such a difficult thing. It seemed like... for most people it [buprenorphine] made a huge difference.

Perceived Scope of Practice—Practitioners frequently raised issues related to scope of practice. It appeared particularly important for clinicians who were not in addiction medicine or chemical dependency departments. Their sense of the appropriate scope of their work related to whether they would be willing to obtain training in order to prescribe buprenorphine, or even to recommend it as an option during the course of a referral to addiction medicine. An example from a primary care clinician is typical of these discussions:

...I think it should be restricted to addiction medicine...if I worked out in the community and I didn't have resources to an addiction medicine clinic, maybe I would be more apt to prescribe it. But...we have this clinic. That's what they do. They are way more aware of how to use medicine than I am, so it's something I hand off, always.

Optimism vs. Pessimism about Treatment Outcomes—Two emergent overarching themes appeared to affect approaches to adoption at the clinician level. The first was whether clinicians seemed optimistic or pessimistic about their ability to help people with opioid addictions, or were hopeful about treatment outcomes. Those who were pessimistic, or seemed “burned out,” seemed less likely to see the value in recommending or prescribing buprenorphine than those who were more hopeful about treatment outcomes. For example:

Clinician: I still like the clonidine/darvocet route because it's short, it's sweet. It's six days. And, patients feel better and they're on their way.

Interviewer: ...what's the success rate with that?

Clinician: The success rate with most opiate addicts is very poor. Very poor. [Buprenorphine] is giving people a lot longer time between relapses. But,

ultimately, they seem to all go back to the opiates. That's a very compelling drug. So, the success rate is not that great.

In contrast, those who were generally more positive about treatment outcomes appeared to be more hopeful about the value of buprenorphine, even while recognizing that many patients might not succeed during any particular treatment episode:

It looks like...that if you see a [buprenorphine] patient once a week, if you see a patient three times a week, or if you see a patient once a month the results are the same. So, I think that if someone called me from an outlying clinic and there wasn't a treatment track available, I would encourage that practitioner to provide buprenorphine or find somebody in the community who could provide buprenorphine, again with the hopes of at least starting the patient on a movement towards becoming healthier...understanding that...it's not going to be magic, that that person is at least 50% likely to not stay on the buprenorphine, or if they do stay on the buprenorphine, they're at least 50% likely to continue using other drugs, but if we could minimize their risk in other areas, I think it's...at least worthwhile to give it a try.

Moralistic or Stigma-related Beliefs about Drug Use—A third emergent overarching theme was an undertone in some interviews suggesting that moralistic or stigma-related beliefs related to drug use affected treatment decisions and recommendations more than might be expected when prescribing or recommending a medication for other health problems. Thus, both clinicians adopting a more moralistic approach, and clinicians pessimistic about treatment for opioid problems generally, were less likely to support use of buprenorphine than other clinicians.

In sum, a variety of clinician characteristics affected willingness to recommend or prescribe buprenorphine. Individuals with abstinence-oriented philosophies of treatment, who eschewed harm reduction approaches, who were pessimistic about treatment outcomes, or who expressed moralistic or stigma-related beliefs about people with addictions appeared less willing to recommend buprenorphine. Clinicians who saw the medication as a “tool” in their “tool box,” who favored harm reduction approaches, or who favored stepped approaches (abstinence first, then buprenorphine) were more likely to endorse its use. Perceived scope of practice limited willingness to adopt among clinicians other than addiction treatment and mental health specialists.

3.5 Outer Setting: Patient Needs and Characteristics

The semi-structured interviews generated insights into perceived patient needs but did not systematically probe other facets of CFIR's outer setting. Several themes emerged related to the development of norms regarding whether patients who take an agonist medication can be considered abstinent, or norms useful in managing legal limits on numbers of patients that can be treated.

Treatment expectations of patients and patient characteristics—Once the medication was available, norms and expectations for patients developed through experience.

...the [buprenorphine] patients are required to do everything that everybody else is. So, in other words, they have to stay clean and sober from every other drug and except for [buprenorphine], you know, that's the only difference. But, you wouldn't know that there is any difference unless you knew that they were on [buprenorphine] because they go to meetings just like everybody else. ... everything's the same. They're just taking [buprenorphine].

One barrier encountered during roll-out was that patients taking buprenorphine were not always admitted to outpatient treatment groups because they were perceived as not being “abstinent.” Responses to this varied, including developing group specifically for buprenorphine patients, and educating clinicians about definitions of “clean and sober” that included taking buprenorphine.

Other norms developed when the medication was used more broadly. One in particular resulted from limits placed on the number of patients who could be prescribed buprenorphine at any one time. Given increasing demands for the medication, one site developed an informal policy of switching patients from buprenorphine to methadone if patients failed to reduce their opioid use:

...if you can't succeed with this [buprenorphine] pretty quickly, off you go. It means methadone for at least six months and then you successfully graduate from [methadone program], you know...because they will be hardnosed. They won't let you get by with anything. [Chuckles.] And then maybe graduate out of there and come back and see us and we will consider [buprenorphine].

Patient attitudes and characteristics—Clinicians identified a number of patient-level factors that affected their willingness to prescribe or recommend buprenorphine. The most straightforward of these factors included patient requests for buprenorphine as word spread about the medication and demand increased:

Oh, they're overwhelmingly receptive to taking it and LOVE it. They think it's the best thing that has come out...Ninety-nine percent of people. I've had maybe one or two people that say they either didn't like the taste of it or that they didn't like the side effects. But I think part of that had to do with...you know, we weren't able to really engage the patient, so they kind of took it in their own hands and they weren't really working with us. But those that work with us and they take our recommendations, they really...their whole life has turned around.

More complicated factors affecting recommendations included clinicians' assessments that a person was at high risk for relapse (including history of relapse following detoxification), social or psychiatric instability, the need for the structure offered by a methadone maintenance program, and the need for harm-reduction strategies for a particular patient. All of these factors, save the need for the structure provided by methadone maintenance, increased willingness to prescribe or recommend buprenorphine. For example:

...if they're homeless or somebody that's at great environmental risk, I think we're going to go first to stabilization as quickly as possible...you could keep detoxing them and they...blow out of treatment and you don't see them for 3 to 6 months. I think that would...move me faster...to putting them on a maintenance program...I can't treat people unless they return. And so...if I don't think they're going to return I'm going to...provide more of a treatment that I think...will really sustain them...so with detoxes we know that when we look at rapid detox versus 21-day detox versus a hundred... they're all dismally poor...what we're kind of hoping on [if we detox] is maybe you're the one out of ten that will succeed. If you're not, I'm going to move even more to this kind of maintenance algorithm.

Clinicians also considered a host of additional patient-level factors when making decisions about treatment approaches. These included history of benzodiazepine use or abuse (a contraindication), age and length of addiction (clinicians were more likely to try to get younger people with shorter addiction histories off all drugs and medications), and whether pain is controlled for pain patients. Patient motivation and commitment to follow through

with treatment, or the clinician's sense that providing the medication would help motivate people to continue in treatment, were also important considerations:

...There needs to be some motivation and there needs to be a demonstration of commitment. We do have people who come in and want it and ask for it specifically, but it's almost like they want it on hand...When you set up your superstructure of saying, I will help you with your opiate withdrawal by using this drug, BUT it's coupled with other things. You know, that's what it takes...that qualifies people, pre-qualifies them.

Occasionally I get burned, because they'll say, yes, I'll start it, but then they won't ever want to come back. They just want another refill and, of course, they don't get it. I'll say, well, I don't want you to go through withdrawal so come in and we'll talk about it, because you're not going through the program. I certainly would not give it to those people who have no commitment. They're just kind of flirting with this.

In sum, patient demand, needs and characteristics were important factors in clinicians' decisions about whether or not to recommend buprenorphine and about tailoring treatment. Clinicians considered patient requests, whether patients could meet treatment expectations, whether psychosocial treatment groups would allow individuals that were taking medications, risk of relapse and motivation for treatment, as well as age, length of addiction, and use of other drugs or medications (e.g., benzodiazepines).

4. Discussion

Examining adoption of buprenorphine for treatment of opioid dependence provides a lens on practice change and organization and delivery of care for substance use disorders. The Consolidated Framework for Implementation Research provides a useful framework for understanding implementation processes. Use of an agonist medication challenges long-held practices of abstinence-oriented care, requires practitioners to develop skills in medication management, and provides opportunities to integrate treatment services within primary care settings. Qualitative interviews, conducted over time during rollout of opioid agonist therapy in two integrated health plans, reveal the diversity of variables influencing treatment for alcohol and drug use disorders.

Initially, a strong leader who championed use of buprenorphine was critical to acceptance and adoption at all levels in both health systems. Clinical leaders advocated to place buprenorphine on the formulary (a critical step towards adoption), worked to find ways within the existing infrastructure and staffing to offer the treatment, promoted the treatment with staff, and arranged and supported professional training. They solved process problems and set practice standards.

Once the health systems began using the treatment, direct experience with patients and stories from other clinicians began to play a more important role in provider decisions. When these experiences were positive, clinicians generally became more supportive of the medication. When they were negative, such as encountering repeated relapses following detoxification, some clinicians moved away from using the medication overall, while others moved to using it as maintenance. Agreed-upon treatment protocols developed and evolved with experience, changing to support maintenance approaches more and more over time, but also addressing methods of identifying and managing patients who were not succeeding on maintenance. Diffusion outside specialty addiction treatment and mental health departments was nonexistent across the two health systems. Clinicians outside those departments, even when recognizing the need for greater diffusion, cited scope-of-practice issues and referred patients to specialty clinicians. This finding is likely to be particularly important in the

context of integrated and other health plans in which referral to specialty addiction treatment is available and expected.

As buprenorphine became more widely used and clinicians developed more experience with the medication, patient demand, history, needs, and desires became primary influences. With greater diffusion also came questions about long-term use and safety, which, at the time the interviews closed, remained unresolved; some ambivalence toward the use of agonist medications continued to be apparent, and practitioners in both health systems varied in their willingness to recommend buprenorphine.

We found both commonalities and differences in implementation across the two health systems. The smaller health system had only two clinics with physicians certified to prescribe buprenorphine (although all 11 addiction medicine clinics provided psychosocial treatment to members with opioid addictions, including those prescribed buprenorphine). The smaller system also had a single chief of addiction medicine, routinely placed patients in methadone treatment before FDA approval of buprenorphine, and had prior experience using buprenorphine in a clinical trial. As a result, adoption was quicker and simpler, and a greater percent of the opioid dependent patients were treated with agonist therapy. The larger system had 27 Chemical Dependency clinics that treated opioid dependence, each with a chief of medicine, and no prior experience with methadone or buprenorphine. In this more complex system, startup occurred more slowly but caught up quickly once a clinical leader championed use of the medication.

Implementation research highlights the slow adoption of medication to treat alcohol and drug use disorders across a wide variety of settings. Sales of medications used to treat alcohol and opioid dependence increased substantially between 2003 (\$35 million in total sales) and 2007 (\$405 million) (Mark, Kassed, Vandivort-Warren, Levit, & Kranzler, 2009) but still account for less than one percent of total expenditures for treating alcohol and drug dependence (Mark, Levit, Vandivort-Warren, Buck, & Coffey, 2011). Interviews with specialty addiction treatment providers suggest that larger treatment programs, with more medical staff, and more affluent patients are more likely to adopt the use of medications (Ducharme, Knudsen, Roman, & Johnson, 2007; Knudsen, Ducharme, & Roman, 2007; Thomas, Miller, Randall, & Book, 2008). Even in programs that make some use of medications, however, only a minority of patients have treatment plans that include medication (Knudsen, Abraham, & Roman, 2011). Our analyses outlines variables that affect adoption and implementation over time, and describe how the importance of various influences changes during the adoption process. Understanding this process has the potential to inform adoption of other pharmacotherapies in other settings, and the new therapies being developed for addiction treatment.

4.1 Limitations

Integrated health systems have idiosyncratic features, compared to fee-for-service systems and freestanding addiction treatment centers. In particular, clinicians in these settings are likely to be insulated from many market factors (other than patient demand), and our results may underestimate some market-driven effects on adoption important in other settings. Thus, some observations from this analysis may not generalize to other health care systems, although even within integrated systems, addiction treatment is a specialty area and general practitioners resisted expanding their scope of practice to include treatment for opioid dependence. Access to buprenorphine, however, may have helped patients and practitioners be more realistic when treating opioid dependence and avoid the stigma frequently associated with methadone maintenance. Results also reflected the moments in time when they were conducted, and federal legislation related to the use of buprenorphine evolved over the duration of the study, facilitating access to the medication.

Treatment for alcohol and drug use disorders, moreover, is changing. Services are increasingly integrated with primary care and new medications are emerging. Approval of extended release naltrexone for both alcohol and opioid dependence provides opportunities to compare adoption of an antagonist medication to the process observed for the agonist medication. Similarly, agonist implants may be attractive to some patients and it will be informative to study adoption and use now that the Food and Drug Administration has approved one of these products. In the near future, patients and physicians may also have access to nicotine and stimulant vaccines; such technologies will challenge treatment providers to continue to evolve and adopt new approaches. Implementation research can provide insights into how to facilitate adoption and promote better care for alcohol, tobacco and drug use disorders.

Acknowledgments

An award from the National Institute on Drug Abuse (R01 DA016341) supported data collection and analysis. We appreciate and thank the clinicians who gave us their precious time to participate in interviews. Thanks also go to the interviewers who traveled to meet those clinicians at the times and places that made those interviews possible: Sue Leung, Ph.D.; Alison Firemark M.A.; Cynthia Perry-Baker, B.S.; Christine Lou, Ph.D.; and Melanie Jackson, B.S. Ms. Firemark and Dr. Leung helped with coding and theme extraction. We thank project managers Agatha Hinman, Shannon Janoff, Leah Wolfe, and later, Alison Firemark.

Reference List

- Abraham AJ, Ducharme LJ, Roman PM. Counselor attitudes toward pharmacotherapies for alcohol dependence. *Journal of Studies on Alcohol and Drugs*. 2009; 70(4):628–635. [PubMed: 19515305]
- Barry CL, Huskamp HA. Moving beyond parity--mental health and addiction care under the ACA. *New England Journal of Medicine*. 2011; 365(11):973–975. [PubMed: 21848453]
- Buck JA. The looming expansion and transformation of public substance abuse treatment under the Affordable Care Act. *Health Affairs (Project Hope)*. 2011; 30(8):1402–1410. [PubMed: 21821557]
- Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci*. 2009; 4:50. [PubMed: 19664226]
- Damschroder LJ, Hagedorn HJ. A guiding framework and approach for implementation research in substance use disorders treatment. *Psychology of Addictive Behaviors*. 2011; 25(2):194–205. [PubMed: 21443291]
- Ducharme LJ, Knudsen HK, Roman PM, Johnson JA. Innovation adoption in substance abuse treatment: Exposure, trialability, and the Clinical Trials Network. *Journal of Substance Abuse Treatment*. 2007; 32(4):321–329. [PubMed: 17481455]
- Friese, S. User's Manual for ATLAS.ti 6.0. Berlin: ATLAS.ti Scientific Software Development GmbH; 2011. Retrieved from http://www.atlasti.com/uploads/media/atlasti_v6_manual.pdf
- Horgan CM, Reif S, Hodgkin D, Garnick DW, Merrick EL. Availability of addiction medications in private health plans. *Journal of Substance Abuse Treatment*. 2007
- Knudsen HK, Abraham AJ, Roman PM. Adoption and implementation of medications in addiction treatment programs. *J Addict Med*. 2011; 5(1):21–27. 10.1097/ADM.0b013e3181d41ddb [PubMed: 21359109]
- Knudsen HK, Ducharme LJ, Roman PM. The adoption of medications in substance abuse treatment: associations with organizational characteristics and technology clusters. *Drug and Alcohol Dependence*. 2007; 87(2–3):164–174. S0376-8716(06)00305-X [pii]. 10.1016/j.drugalcdep.2006.08.013 [PubMed: 16971059]
- Knudsen HK, Roman PM, Ducharme LJ, Johnson JA. Organizational predictors of pharmacological innovation adoption: The case of disulfiram. *Journal of Drug Issues*. 2005; 35:559–574.
- Lynch F, McCarty D, Mertens J, Perrin N, Green C, Parthasarathy S, et al. Costs of care for persons with opioid dependence in two integrated health systems. *Addiction Science and Clinical Practice*. 2013 (under review).

- Mark TL, Kassed CA, Vandivort-Warren R, Levit KR, Kranzler HR. Alcohol and opioid dependence medications: prescription trends, overall and by physician specialty. *Drug and Alcohol Dependence*. 2009; 99(1–3):345–349. S0376-8716(08)00305-0 [pii]. 10.1016/j.drugalcdep.2008.07.018 [PubMed: 18819759]
- Mark TL, Levit KR, Vandivort-Warren R, Buck JA, Coffey RM. Changes In US spending on Mental Health And Substance Abuse Treatment, 1986–2005, and implications for policy. *Health Affairs (Project Hope)*. 2011; 30(2):284–292. 30/2/284 [pii]. 10.1377/hlthaff.2010.0765 [PubMed: 21289350]
- Reif S, Thomas CP, Wallack SS. Factors determining how early adopter physicians use buprenorphine in treatment. *J Addict Med*. 2007; 1(4):205–212. 01271255-200712000-00006 [pii]. 10.1097/ADM.0b013e31814c3fa8 [PubMed: 21768959]
- Rieckmann T, Daley M, Fuller BE, Thomas CP, McCarty D. Client and counselor attitudes toward the use of medications for treatment of opioid dependence. *Journal of Substance Abuse Treatment*. 2007; 32(2):207–215. S0740-5472(06)00307-2 [pii]. 10.1016/j.jsat.2006.09.002 [PubMed: 17306729]
- Rogers, EM. *Diffusion of innovations*. 5. New York: Free Press; 2003.
- Savage SA, Abraham AJ, Knudsen HK, Rothrauff TC, Roman PM. Timing of buprenorphine adoption by privately funded substance abuse treatment programs: the role of institutional and resource-based interorganizational linkages. *Journal of Substance Abuse Treatment*. 2012; 42(1):16–24. S0740-5472(11)00118-8 [pii]. 10.1016/j.jsat.2011.06.009 [PubMed: 21831565]
- Substance Abuse and Mental Health Services Administration. CSAT Buprenorphine Information Center. 2012a. Retrieved from <http://buprenorphine.samhsa.gov/data.html>
- Substance Abuse and Mental Health Services Administration. National Survey of Substance Abuse. 2012b.
- Treatment Services (N-SSATS). HHS Publication No (SMA) 12–4730. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2011. Data on Substance Abuse Treatment Facilities. BHSIS Series S-64
- Thomas, CP.; McCarty, D. Adoption of drug abuse treatment technology in specialty and primary care settings. In: Harwood, HJ.; Myers, TG., editors. *New treatments for addiction: Behavioral, ethical, legal and social questions*. Washington, DC: The National Academies Press; 2004. p. 140-172.
- Thomas CP, Reif S, Haq S, Wallack SS, Hoyt A, Ritter GA. Use of buprenorphine for addiction treatment: Perspectives of addiction specialists and general psychiatrists. *Psychiatr Serv*. 2008; 59(8):909–916. [PubMed: 18678689]
- Thomas CP, Wallack SS, Lee S, McCarty D, Swift R. *Journal of Substance Abuse Treatment*. Research to practice. Adoption of naltrexone in alcoholism treatment. 2003; 24(1):1–11.
- Thomas SE, Miller PM, Randall PK, Book SW. Improving acceptance of naltrexone in community addiction treatment centers: a pilot study. *Journal of Substance Abuse Treatment*. 2008; 35(3): 260–268. S0740-5472(07)00348-0 [pii]. 10.1016/j.jsat.2007.11.001 [PubMed: 18329227]
- Wallack SS, Thomas CP, Martin TC, Chilingerian J, Reif S. Substance abuse treatment organizations as mediators of social policy: slowing the adoption of a congressionally approved medication. *Journal of Behavioral Health Services & Research*. 2010; 37(1):64–78.10.1007/s11414-008-9132-4 [PubMed: 18668369]
- Walley AY, Alperen JK, Cheng DM, Botticelli M, Castro-Donlan C, Samet JH, et al. Office-based management of opioid dependence with buprenorphine: Clinical practices and barriers. *Journal of General Internal Medicine*. 2008; 23(9):1393–1398. [PubMed: 18592319]

Clinician Interview Guide

1. I'd like to start by asking you to tell me a little bit about you...
How long have you been a clinician? What is your clinical background/training?
2. How long have you been working with drug- or alcohol-dependent patients?
How many patients with opioid dependence do you typically see?
What are the most common drugs for which they seek treatment?
3. We know that chronic pain patients sometimes develop problems related to their use of opioids. Could you tell me about what might raise concerns for you regarding opioid use in these patients?
4. *(non-addiction medicine clinicians)* If you develop concerns about a chronic pain patient's use of opioids, at what point do you address the potential problem or make a decision to do something about the problem?
What do you usually do if you determine there is a problem?
How satisfied are you with how it usually turns out?
5. What do you generally believe is the best short-term approach for opioid-dependent patients?
Prompts:
Detox options?
Inpatient treatment?
Outpatient Psychosocial counseling?
Maintenance medication?
6. What do you generally believe is the best long-term approach for these patients?
Long-term maintenance on an opioid replacement medication (like methadone)?
Maintenance with a later transition to drug free?
(If this option) How long on maintenance?
Type of maintenance medication?
7. Could you tell me how different patient characteristics might affect your approach?
Prompts: Patient age or gender?
Length of drug use?
Patient's Environment?
Patient's risky behaviors?
Medical or psychiatric comorbidities?
8. Could you tell me about how the type of problem opioid might affect your approach (for example heroin vs. OxyContin)?
9. *(If buprenorphine NOT mentioned)* Have you heard about a medication called buprenorphine?
(If buprenorphine mentioned) Go directly to *(If yes)*
Prompts: *(If yes)* What do you know about buprenorphine? (provide info from "If no" response if knowledge is limited)
How did you learn about buprenorphine?
How effective do you think it is for treating opioid dependence?
(If no) Buprenorphine is a recently developed treatment for opiate dependence. It is taken as a pill and absorbed under the tongue. It substitutes for opiates (like heroin) and prevents withdrawal symptoms. Potential side-effects include constipation and sleepiness. People generally get used to it and function normally, including at work. If people stop taking it, they go through withdrawal within 72 hours, but symptoms are generally mild. It can be used for maintenance or detox.
10. *(If knew about buprenorphine)* Have you ever recommended buprenorphine to opioid-dependent patients? Why or why not?
Prompts:
For detox? For maintenance?
What has been your thinking about it?
Do you have concerns about its use with drug-seeking patients?
For heroin users?
For patients dependent on opiate analgesics?
In response to patient requests?
What have been your experiences with patients taking it, if any?
(If just learned about buprenorphine) Could you tell me about your initial reactions regarding buprenorphine? What are your thoughts about possibly recommending it or learning more about it?
11. To what extent might health plan policies or characteristics affect your decision to recommend or prescribe buprenorphine?
Prompts: On or not on the formulary?
Paying you to attend a training about the medication?
Availability of other clinicians in the clinic who could prescribe the medication?
Prevalence of opioid dependence among your patients?
Encouragement by the chief of your service unit or other clinicians who provide addiction treatment?
Availability of specialty addiction medicine department/clinicians?
Pharmacy/dispensing access/policies?
12. Could you tell me about how costs might affect your decision to recommend or prescribe buprenorphine compared to other options?
Prompts: Overall costs to the health plan of the treatment?
Costs to your department?
Cost effectiveness of the treatment?
Costs of the medication (compared to other medications)?
Costs to the patient?
13. How willing do you think opioid dependent patients would be to take buprenorphine?
Prompts: For detox?
As a maintenance medication?
To what extent have you discussed this with your patients?
Have patients brought up the topic with you?
14. Before we finish, I'd like just like to ask if I missed anything I should know about your thinking about using buprenorphine, or about the best ways to treat such dependence generally?

Figure 1.

Interview guide for clinician interviews.*

*Notes to interviewers, formatting, and some prompts were deleted/consolidated to reduce figure size. Guides for administrators were modified slightly to request more information about administrative concerns.

Table 1

Departmental affiliations of interview participants.

Department	<i>n</i>
Addiction Medicine/Chemical Dependency	36
Psychiatry in Addiction Medicine/Chemical Dependency	4
Primary Care (Internal Medicine, Family Practice)	11
Obstetrics/Gynecology/Perinatology	4
Pharmacy	5
Mental Health/Psychiatry	13
Pain Clinic/Pain Management	4
Emergency Department	4
Hospitalists	3
Surgery	2
Dental	2
Physiatry	1
Anesthesiology	2
Immune Deficiency	2
Administration	2