Title of Project:
Project Next Steps: Using the Stepped Care Model to Improve Chronic Pain Outcomes in a Community Health Center

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Purpose: Project Next Steps aims to improve pain management in primary care by providing primary care (PCPs) and behavioral health (BHPs) providers access to Project ECHO® case-based learning sessions and electronic consultations (eConsults) with specialist pain care providers. Building capacity to treat pain in primary care will increase the quality of pain care delivered to vulnerable populations who seek treatment at safety-net medical clinics.

Scope: Providing effective, evidence-based care for Federally Qualified Health Center (FQHC) patients with pain represents a significant challenge. The Project ECHO® model was utilized to educate FQHC PCPs and BHPs on caring for patients with pain.

Methods: A quasi-experimental design with comparison group methodology was utilized. Intervention (n=30) and control (n =11) participants were recruited from FQHCs in Connecticut and Arizona. Intervention providers attended weekly Project ECHO® Pain sessions and had access to eConsults from a specialty team at the Integrative Pain Center of Arizona. Surveys and focus groups were conducted to assess PCPs' and BHPs' pain-related knowledge, attitudes and self-efficacy. Electronic Health Record data were analyzed to determine the impact of the intervention on clinical care and patient outcomes.

Results: PCPs' pain-related knowledge (p=.001) and self-efficacy to treat patients with pain (p<.001) increased significantly between pre and post intervention. Patients presented at ECHO® were referred to behavioral health more frequently (45% pre/52% post) and 31% had their opioid medication decreased, concurrent with a decrease in pain score.

Key Words: Pain, Project ECHO®, Primary Care, Federally Qualified Health Center

Purpose:

The principal goal of Project Next Steps was to improve the quality of care provided to patients with chronic non-cancer pain in primary care by improving the knowledge, competence, and self-efficacy of primary medical and behavioral health providers to work collaboratively to manage chronic pain. To accomplish this goal, Project Next Steps had the following specific objectives:

1. Provide primary care providers with access to virtual "curbside" consultation from pain specialists by implementing an eConsult secure messaging system.
2. Provide weekly "Project ECHO®" case-based learning via video conference between a team of pain management specialists and primary medical and behavioral health staff practicing in multiple sites in two different states (Connecticut and Arizona).
3. Increase the number of patients with chronic pain receiving integrated behavioral health and medical care.
4. Spread the intervention to Federally Qualified Health Center (FQHC) sites in states outside of Connecticut and Arizona.

Scope (Background, Context, Settings, Participants, Incidence, Prevalence)

Background and Context:

Access to specialty care is a major challenge for underserved populations such as those cared for in Federally Qualified Health Centers (FQHCs). While patients living in rural areas face particular access challenges, medically underserved patients living in urban areas often have equal difficulty securing access to needed specialists. Community Health Centers provide access to quality primary care, but they often struggle to find specialists willing to see patients with publicly funded insurance or without insurance coverage. Novel approaches are needed to ensure that all patients have access to needed consultation and expert specialty care.

Nowhere is the need for new approaches more acute than in the management of chronic pain. Providing effective, evidence-based care for patients with pain represents a significant challenge. Pain is among the most common complaints in primary care and studies show wide variability in the quality of pain care delivered by primary care providers.[1-3] Primary care providers receive little training in pain management,[4-5] and surveys suggest that providers feel unprepared and undertrained to provide appropriate care for complex pain cases.[6] Managing patients with chronic pain is challenging and time consuming. Evidence-based standards of care call for a multimodal approach involving multiple disciplines, depending on the individual needs of each patient. Comprehensive pain centers capable of providing such care are relatively rare, and many do not accept public insurance plans or patients without insurance. Access to such centers is extremely limited.

Project ECHO® is an evidence-based intervention that connects primary care providers with expert teams of specialist providers via regularly scheduled videoconference.[7] During these videoconferences, specialists use brief didactics and actual cases submitted by participants to instruct primary care providers on best practices for specific conditions. This novel project is designed to bridge the gap between specialty and primary care to improve access and health outcomes for underserved patients. Unlike traditional telehealth, ECHO focuses on the primary care provider rather than the patient. The purpose is to provide specialist support and education to help primary care providers manage cases that would otherwise be referred out to specialists. This process serves as a "force multiplier", creating local content experts within the primary care clinic. First conceived as a project to address rural health access issues in New Mexico, Project ECHO® is now being spread to sites across the United States in both urban and rural location. Research on Project ECHO®'s hepatitis C clinic has demonstrated that primary care providers participating in the ECHO clinic can achieve equal or superior treatment outcomes as compared to specialists treating the same condition.[8]

While the clinical impact of Project ECHO has been effectively demonstrated for treatment of hepatitis C, less is yet known about the operational and financial impact of the program for managing other conditions. Currently, few funding mechanisms exist to support and sustain such clinics. The lost productivity costs to health centers participating in Project ECHO®, and the costs in infrastructure and support to run such clinics are significant for health centers that wish to participate in Project ECHO® clinics. However, these costs may be more than offset by savings that are realized to the health system as a result of enhanced quality, improved clinical outcomes, improved efficiency, reduction in face to face specialty consults, and decreased hospital and emergency room utilization.

Electronic consultation (e-Consults) projects have been also developed to help address the issue of specialty access for underserved populations and to improve communication between specialists and primary care providers. These projects provide education and direct, case-based support for the primary care provider. Eliminating unnecessary in-person visits saves time and money, and increases convenience for PCPs, specialists, patient and payers. The results from an eConsult program in San Francisco safety net clinics showed that as a result of using electronic consultations, the need for actual "in person" consults fell by as much as 50 percent.[9] eConsults strengthen the primary care provider's knowledge and skills by providing expert feedback and teaching in the context of each consultation. Results from a cardiology eConsult pilot at CHCI that utilizes a secure "peer-to-peer" communication module within the electronic health record suggest that primary care providers received enough advice and guidance from the eConsult to manage the case without a face-to-face consult in 90 percent of cases.

Project Next Steps made use of eConsults to provide peer-to-peer consultation between an outside multidisciplinary team of pain specialists and primary care medical and behavioral health providers at CHCI and El Rio for pain-related cases that are short and simple or that do not require multidisciplinary consultation.

Project Next Steps is based on the Stepped Care Model for Chronic Pain Management, which calls for a stepwise approach to pain management beginning in primary care, and including additional interventions such as behavioral health and addiction services as patients increase in complexity.[10] In the year preceding the intervention, only 19 percent of CHCI patients with chronic pain had a visit with a CHCI mental health provider or were referred to an outside provider, despite the fact that patients with chronic pain were twice as likely to have a behavioral health diagnosis as patients in the overall clinic population. Given the high rate of coexisting mental health and substance abuse problems in patients with chronic pain and the relatively low rate of utilizing such services in primary care, Project Next Steps focused on promoting closer integration and teamwork between behavioral health providers and primary care providers at CHCI and El Rio.

Incidence and Prevalence:

Prevalence estimates suggest that up to 116 million Americans have chronic pain. Chronic low~~er~~ back pain is the leading cause of job-related disability in America[11], leading to loss of productivity and loss of personal income. In the U.S., an estimated $635 billion in medical treatment and lost productivity costs are attributable to chronic pain each year[12-13], making it a medical condition that is burdensome to individuals as well as to the U.S. economy.

Most current guidelines define chronic pain as pain lasting beyond the normal time for a disease process or injury to heal. This time is somewhat arbitrarily defined as greater than three months.[14-16] Determining the true prevalence of chronic pain accurately is limited by the lack of a standard definition of chronic pain, heterogeneity in etiologies of chronic pain and varied survey methodologies. Estimates of the prevalence of chronic pain in the general population range from 7% to 55%[17], but on average cluster around 25% to 35%.[18-21] Whether the actual prevalence is at the lower end of this range or higher, these numbers demonstrate that chronic pain is extremely common, more so than many other common chronic illnesses such as diabetes, asthma, or depression.

Chronic pain has a significant adverse impact on patients' lives as well as on their families and the wider community. Chronic pain has a serious negative impact on quality of life over the long term[22]. The average chronic pain patient has lived with pain for over a decade. Patients with chronic pain experience a variety of negative effects on their lives, including difficulty moving (89%), emotional disturbances such as depression (77%), inability to concentrate (70%), strained relationships (52%), and loss of appetite (46%).[23] Adults who suffer from chronic back pain are four times more likely to experience serious psychological distress than the general population,[11, 24] and twice as likely to be at risk for suicide.[25] The National Sleep Foundation reports that 20% of adults in America experience substantial sleep disruption due to pain or discomfort.[26] In general, patients who have chronic pain in addition to other chronic illnesses experience increased disability and poorer health.[22]. One study found that 40% of chronic pain patients were also overweight, 39% had hypertension, 32% had asthma, 24% had diabetes and 11% had a heart condition.[22]

Chronic pain impacts some populations more than others. Pain is more common in medically underserved patients as well as in older patients.[27] These populations also have higher rates of behavioral health co-morbidities that may negatively contribute to poor pain outcomes and place additional burdens on providers and patients. Thus, pain has a greater impact on populations who are more vulnerable and face greater challenges to accessing healthcare.

Despite the prevalence of chronic pain and the frequency of pain-related comorbidities in the general population, patients are dissatisfied with the treatment they receive for their chronic pain. Over half of patients with chronic pain feel they have little or no control over their pain symptoms, even when using prescribed opioid medications. Only 23% of patients report that they feel opioids are effective in managing their pain. Two-thirds of patients with chronic pain do not feel that opioid medications are very safe.[23] These concerns are justified. Nearly 15,000 Americans died from prescription pain medication overdose in 2008, more than three times the number who died of the same cause in 1999.[28]

Over half of the patients with chronic pain receive their care in a primary care setting.[29] Despite this fact, evidence suggests that primary care providers are not well-equipped to manage chronic pain effectively. Most PCPs express low confidence in their ability to effectively manage pain[30-34] and receive little or no pain management education during medical training.[35-37] A recent survey of internal medicine residents found that only 26% expressed confidence in managing chronic non-cancer pain.[38] In addition, there is wide variation in primary care providers' adherence to guidelines for documentation and management of pain.[39-41] Opioids are increasingly being prescribed by primary care providers to treat chronic non-cancer pain,[34,42], despite limited evidence for their effectiveness.[43]. Since 1990, the use of prescription opioids has increased by a factor of 10,[44] in large part driven by efforts to increase the appropriate recognition of pain through "pain as the 5th vital sign" initiatives. This increase in use has been associated with marked increase in opioid-related morbidity and mortality.[13, 44-46]

<u>Setting and Participants:</u>

Participants in Project Next Steps were primary care medical and behavioral health providers from 12 sites at Community Health Center, Inc. (CHCI) in Connecticut and 4 sites at El Rio Community Health Center (El Rio), in Arizona.

CHCI, Connecticut's largest network of FQHCs, has primary care sites in 13 towns across the state, providing care to 130,000 patients with a staff of over 1000 employees. El Rio Community Health Center is a large community health center, serving over 76,000 patients in 16 practice sites in Tucson, AZ.

The Faculty Team for Project ECHO Pain sessions is comprised of a group of expert pain care providers from the Integrative Pain Center of Arizona (IPCA), in Tucson, AZ. IPCA achieved the American Pain Society designation of "Center of Excellence" in Pain Medicine and employs an interdisciplinary team dedicated to optimizing health care through an individualized, patient centered approach.

Weitzman Institute at Community Health Center, Inc. collaborates with the faculty team at IPCA to coordinate and run weekly Project ECHOPain sessions. Community Health Center, Inc. manages the operational details of organizing each ECHO session's agenda, ensuring that participants are able to connect via videoconference, maintaining a database of operational data (ie: attendance, Continuing Medical Education [CME], details of presented cases, number of cases presented per provider and participating health center, etc.) and assesses provider knowledge, self-efficacy to treat patients with complex chronic pain and satisfaction with ECHO sessions. The faculty team at the Integrative Pain Center of Arizona serve as a panel of pain management specialists who review and discuss submitted cases and present didactic material on pain-related topics. Select IPCA faculty members also receive electronic consultations (eConsults) from CHCI and El Rio providers and are responsible for reviewing the patient case and sending an electronic response.

Methods:

Study Design:

Project Next Steps utilized a quasi-experimental design with comparison group methodology. Intervention and control group participants were recruited from 16 sites from two Federally Qualified Health Centers: 12 from Community Health Center, Inc. in Connecticut and 4 from El Rio Community Health Center in Arizona. A primary care medical provider (PCP) and a behavioral health provider (BHP) were recruited from each site to attend weekly Project ECHO Pain sessions and complete pre-intervention and post-intervention surveys. Control providers from each site were also recruited. Intervention group providers were twelve primary care medical providers and twelve behavioral health providers from CHCI and three primary care medical providers and three behavioral health providers from El Rio. There were seven primary care medical providers from CHCI and four primary care medical providers from El Rio in the control group for PCPs. There was no control group for behavioral health providers.

Intervention:

Participants were recruited using convenience sampling. Primary care medical providers were informed about the study and once a list of interested providers was generated, one provider from each participating CHCI and El Rio site was chosen to participate in the Project Next Steps intervention. At sites where more than one primary care medical provider was interested in participating in the study, one provider was chosen to participate in the intervention group based on the following factors: ability to attend Project ECHO Pain sessions, chronic pain patient panel size, ability to find an appropriate matched control, and input from the onsite medical director. All primary care providers not chosen to participate in the intervention were asked to serve in a control group. Behavioral health providers were informed about the study separately, and the direct input of the Behavioral Health Clinical Director was obtained in order to generate a list of behavioral health providers from participating sites who see patients with chronic pain. In cases where there was more than one interested BHP for a site, a provider was chosen to participate in Project Next Steps based on ability to attend Project ECHO Pain sessions

and input from the clinical director on which behavioral health provider at each site could benefit most from a pain-related intervention.

An electronic consultation system was put in place to allow intervention group primary care medical providers at 12 CHCI sites and 3 El Rio sites to electronically submit cases directly to pain specialist members of the faculty team at the Integrative Pain Center of Arizona for their feedback. Providers were asked to submit eConsults for cases that were straightforward and did not require multidisciplinary consultation (ie: questions about whether a medication dosage was correct, potential drug substitutions and interactions, general questions about treatment methodologies, etc.). Responses were returned to providers who sent electronic consultations to IPCA within 48 hours of initial submission, and included information tailored to the particular patient or issue that was the subject of the provider's question. Throughout the course of the project, 15 eConsults were submitted to the IPCA team and 100% of submitted consults were answered within 48 hours.

An interactive videoconference technology platform was deployed to participating sites to support weekly Project ECHO Pain sessions for providers participating in the intervention. Primary care medical and behavioral health providers participating in Project Next Steps attended weekly, 2-hour Project ECHO Pain sessions held via live videoconference between participating sites at CHCI and El Rio and the faculty team's practice site at the Integrative Pain Center of Arizona. During the videoconference sessions, primary care medical and behavioral health providers were invited to co-present difficult multi-factorial pain-related patient cases to the faculty team at the Integrative Pain Center of Arizona. Between 3 and 4 patient cases were scheduled for discussion each week, alongside a didactic on a pain-related topic that was delivered by a member of the IPCA Pain ECHO faculty or by an invited guest presenter. All Project Next Steps participants were given access to a secure project website, case submission and presentation forms and a project database and data collection system. Project Next Steps participants who were unable to attend a live Project ECHO Pain session were given the option of viewing recordings of each case and didactic presentation on the secure project website.

Between the launch of Project ECHO Pain on January 3, 2013 and the final session that was part of Project Next Steps (December 19, 2013), 50 Pain ECHO sessions were held. Each Project Next Steps Pain ECHO session was led by 6 faculty at IPCA and attended by ~36 medical and behavioral health providers from participating sites at CHCI and El Rio (20 providers at 11 FQHC sites at CHCI, 6 providers at 3 FQHC sites at El Rio). During the intervention period, 50 didactic presentations were delivered by the IPCA faculty on topics related to evidence-based pain management. During the intervention period, 107 unique patients with chronic pain and complex medical and behavioral health comorbidities had their cases presented by providers at CHCI and El Rio to expert pain management faculty at IPCA during ECHO sessions. Twenty-one of these patients have had their cases followed-up at subsequent ECHO sessions. Each presented case was comprehensively discussed by all medical and behavioral health providers, and an integrated treatment plan was developed with the assistance of expert pain management faculty at IPCA.

Data Sources, Data Collection and Measures:

Provider practice variables, presented patient outcomes, and operational data from Project ECHO Pain clinics were measured and analyzed. Data were obtained via electronic health records, chart review and provider surveys. Provider-specific outcomes include pain-care knowledge scores and self-efficacy scores.

The following measures were used to evaluate Project Next Steps:

Instrument	Frequency	Who Completes?	Measures What	Method of Administration
(1) Chart Review Data	Pre and Post	Gathered by research assistant at CHCI	Opioid prescribing, pain scores, and behavioral health referrals	Chart review of EHR data conducted by a research assistant
(2) Know-Pain-50 (KP-50)	Pre and Post	Primary Care Medical Providers (Intervention and Control)	A 50-item validated measure designed to assess primary care medical providers' pain management knowledge.	Online via Survey Monkey
(3) University of New Mexico Project ECHO® Pain Knowledge Survey	Pre and Post	Primary Care Medical Providers (Intervention and Control)	A 20-item measure designed to assess primary care medical providers' pain management knowledge	Online via Survey Monkey
(4) University of New Mexico Project ECHO® Pain Self-Efficacy Survey	Pre and Post	Primary Care Medical Providers (Intervention and Control)	A 21-item measure designed to assess primary care medical providers' self-efficacy to treat patients with pain	Online via Survey Monkey
(5) Dobscha Self-Efficacy Survey	Pre and Post	Primary Care Medical Providers (Intervention and Control)	An 11-item measure of primary care medical providers' attitudes and self-efficacy regarding provision of care to patients with pain.	Online via Survey Monkey
(6) Behavioral Health Attitudes	Pre and Post	Behavioral Health	A 33-item measure of behavioral	Online via Survey

and Knowledge Regarding Chronic Pain Survey		Providers (Intervention)	health providers' pain-related attitudes and knowledge	Monkey
(7) Behavioral Health Decision Making Regarding Pain	Pre and Post	Behavioral Health Providers (Intervention)	A 33-item measure of behavioral health providers' decision making abilities regarding pain	Online via Survey Monkey
(8) ECHO Satisfaction Surveys	Weekly, at Pain ECHO sessions	All providers who attend Project ECHO Pain sessions	Satisfaction with content and conduct of Project ECHO Pain sessions	Completion and submission of Continuing Medical Education (CME) evaluation forms for each ECHO session
(9) Focus Groups on Providers' Experiences Participating in Project ECHO Pain	After 6 months of ECHO participation and 1 year of ECHO participation	All providers and faculty team members who attend Project ECHO Pain sessions	Qualitative evaluation of providers' satisfaction with content and delivery of Project ECHO Pain sessions and the value of Project ECHO Pain to their practice	Focus groups held after 6months of participation in Project ECHO Pain sessions and after 1 year of participation in Project ECHO Pain sessions.

<u>Limitations:</u>

Convenience sampling may limit the generalizability of the results. The small sample size for this study is also a limitation.

The following limitations were also noted:

Perception of the time burden of Project ECHO Pain participation: The 2-hour weekly time commitment required for a provider to attend ECHO sessions was seen by some providers as a barrier to participation, preventing some providers from expressing interest in the study. This concern was also noted among providers who participated in Project ECHO Pain, and was addressed by giving all providers participating in ECHO access to recorded case presentations and didactic presentations via the project

website, for their review if they are not able to attend an ECHO session or can only attend part of the session.

Effect of Project ECHO® *Pain presentations on providers' clinical time:*
The time commitment necessary to prepare a case for presentation at an ECHO session was initially seen as a barrier by some providers participating in Project ECHO Pain. This concern was addressed during the study by creating a presentation schedule for each ECHO session and assigning providers to prepare and submit cases well in advance of their assigned date. Providers were also given the opportunity to present ad-hoc cases at weekly sessions, or to present general questions or short (5-10 minute) patient cases to IPCA instead of a full patient case. Future studies should take into account that participating primary care providers have numerous demands on their time, and should introduce the ability to present ad-hoc cases, general questions and short cases from the outset of the intervention.

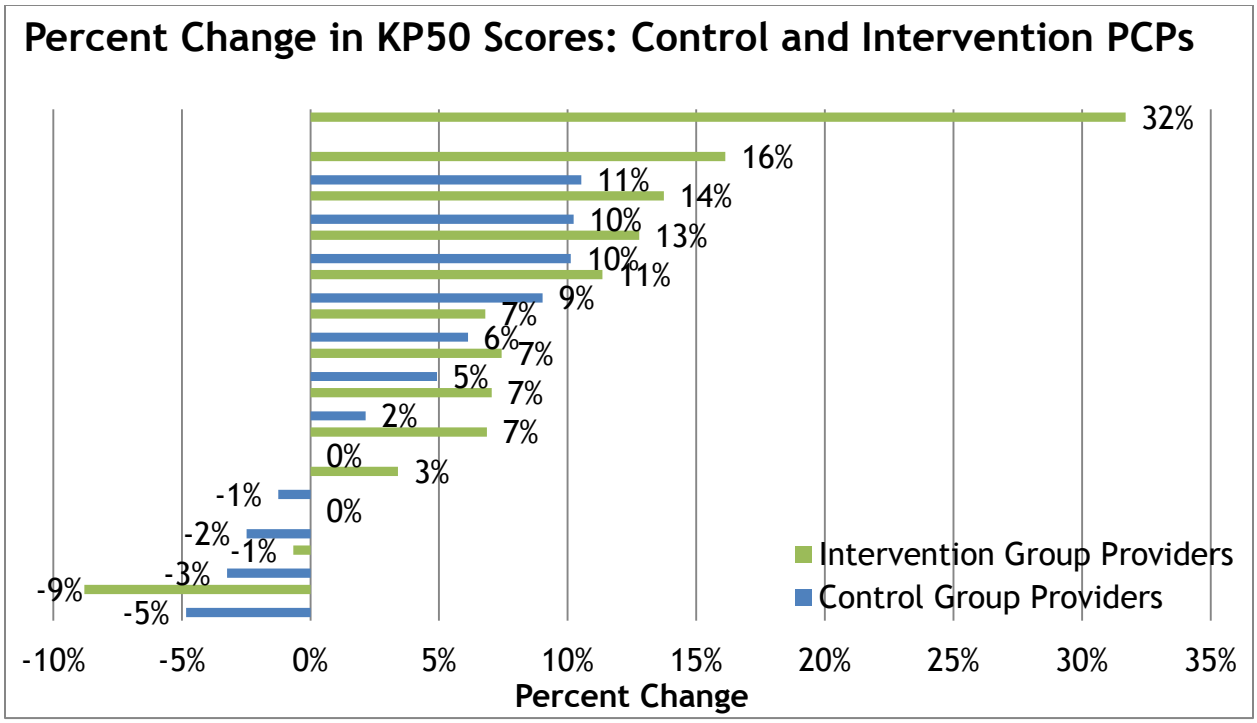
Behavioral health provider surveys: The research team was not able to identify any validated surveys to administer to behavioral health provider participants to assess the impact of Project Next Steps. Two surveys obtained from peer-reviewed research articles were administered to behavioral health providers in the intervention group to assess their pain-related knowledge and attitudes and their decision-making regarding pain. Pre-post improvement was noted on the pain-related knowledge and attitudes survey, but no change in decision-making score was observed between pre-intervention and post-intervention.

Nonparticipation of Planned Project Partner (CORE Health)
An unforeseen barrier was the nonparticipation of CORE Health, a Massachusetts organization that had committed to partnering with CHCI to complete project objectives. CHCI was able to secure partnerships with the DE Dept. of Social Services and FQHCs in CA, ME and NJ to add additional health centers in those states to the ECHO team.

Results

Principal Findings and Outcomes:

Primary Care Medical Provider Knowledge: Results from pre and post-intervention administration of the Know-Pain-50 (KP-50) survey to PCPs who participated in Project ECHO Pain sessions indicated a statistically significant increase in pain management knowledge between baseline (mean = 157.00) and post-intervention (mean = 169.54, p = .001). The intervention group had a statistically significant increase of 12.54 points on the KP50 pre and post, as compared to a 5.50 point increase in the control group pre and post. (Total possible score KP-50 score is 250 points.)



Primary Care Medical Provider Self-Efficacy to Treat Patients with Pain: Results from a 21-item survey asking each respondent to rate his or her skills, knowledge or competence on topics related to Project ECHO reveal that at baseline the control group (n=11) had a mean score of 4.62 (out of 7) and the intervention group (n=12) had a mean score of 4.21. The control group's score increased to a mean of 4.95 at follow up while the intervention group's score had a statistically significant increase ($p<.001$) to a mean of 5.08 at follow up. Response options range from 1 to 7, with 1 indicating "None or no skill" and 7 indicating "Expert, teach others". These results indicate that after participating in Project ECHO Pain sessions for one year, PCPs had increased self-efficacy to manage and treat patients with complex chronic pain.

Primary Care Medical Provider Attitudes and Beliefs Regarding Pain: Results from an 11-item survey that measures providers' self-efficacy, attitudes and beliefs regarding pain[47] indicate that after participation in Project ECHO Pain for one year, primary care medical providers were more aware of and concerned about the issue of addiction and prescription opioids ($p=.06$). Providers participating in Project ECHO Pain sessions were also significantly more likely than control providers to note using pain assessments or monitoring tools ($p= .02$) and opioid agreements ($p=.05$) with their patients after having participated in one year of Project ECHO Pain sessions.

Item #	Item	Period	Intervention	Control	p-value
1	Skilled chronic pain management is a high priority for me.	Baseline	5.33	4.82	0.15
		Post	5.00*	4.82	0.65
2	My management of	Baseline	2.25	2.00	0.53

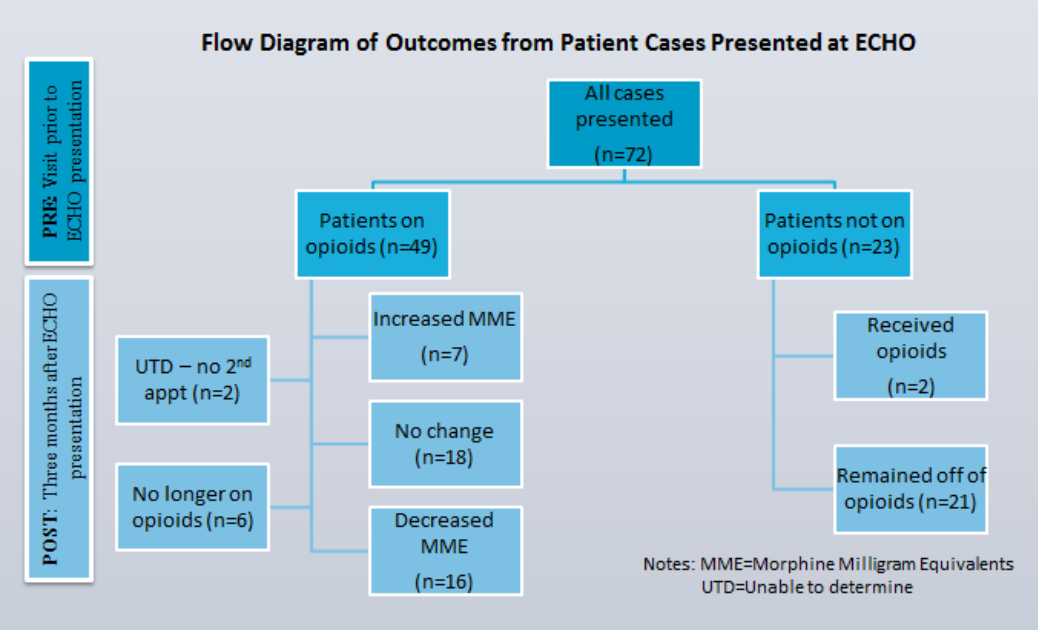
	chronic pain is influenced by experience with addicted patients.	Post	2.42	2.27	0.71
3	My management of chronic pain is influenced by fear of contributing to dependence.	Baseline Post	2.83 3.58	2.82 2.91	0.98 0.09
4	I have adequate time to manage most patients with chronic pain.	Baseline Post	2.17 2.75	2.18 2.18	0.97 0.22
5	Fear of narcotic regulatory agencies/administration influences my decisions regarding chronic pain management.	Baseline Post	3.50 4.00	3.72 4.00	0.62 1.00
6	Analgesic side effects hinder my efforts to treat patients with chronic pain.	Baseline Post	3.92 3.92	3.73 3.73	0.71 0.68
7	Patients I treat become addicted to opioids.	Baseline Post	3.50 4.42*	3.45 3.82	0.90 0.06
8	I use an opioid agreement with my patients.	Baseline Post	5.50 5.92	4.73 4.91	0.11 0.05†
9	I use a pain assessment or monitoring tool.	Baseline Post	4.67 5.17	4.18 4.18	0.23 0.02†
10	I am confident in my ability to manage chronic pain.	Baseline Post	4.17 4.75	4.36 4.45	0.69 0.34
11	I am satisfied with the quality of resources available to help me manage patients with chronic pain.	Baseline Post	3.00 3.67	3.55 3.27	0.28 0.48

* Denotes pre and post within-group statistical significance.

† Denotes between-group statistical significance. P values are calculated between intervention and control groups for baseline and post.

Behavioral Health Provider Pain-Related Knowledge and Attitudes: Results from a 33-item survey designed to assess behavioral health providers' attitudes and knowledge about treating patients with pain and administered to 13 behavioral health clinicians participating in Project Next Steps showed an increase in mean score between pre-intervention (M = 19.85 and post-intervention (M = 22.54, maximum score = 36). Results from a 35-item decision-making about pain survey administered to the group of 13 behavioral health providers who participated in Project Next Steps show no change in behavioral health decision-making ability between pre-intervention survey (M = 37.75) and post-intervention (M = 38.25; ideal score is 0).

Chart Review Data – Patient Outcomes among Patients Presented at Project ECHO Pain: Chart review was conducted for each unique patient presented at a Project ECHO Pain session by a CHCI provider. Patient medical records were reviewed for the time period beginning three months before the date of their case being presented at a Project ECHO Pain session and ending three months after the date of presentation. Among the 72 unique patients presented by CHCI providers, 31% of patients had the dose of their prescription opioids reduced, while the average pain score decreased slightly from 7.02 to 6.81 (on a 10-point scale). The percentage of behavioral health co-management also improved from 45% of patients presented at Project ECHO Pain sessions having seen behavioral health in the three month period preceding presentation of their case at ECHO to 52% of patients having seen behavioral health in the three month period following their case presentation at ECHO.



Providers' and Faculty Teams' Experience with Pain ECHO Sessions: A focus group was conducted with all primary care medical and behavioral health providers participating in Project ECHO Pain in June 2013, to assess their opinions of Project ECHO Pain sessions and the applicability of Pain ECHO content to their practice. During this focus group, the faculty team was also invited to speak about their experiences leading Project ECHO Pain sessions and interacting with participating providers via videoconference and eConsult. A follow-up focus group was held in December 2013 with project ECHO PCP and BH participants and the faculty team to assess their opinions of the completed Project Next Steps Intervention and their suggestions for improving Project ECHO Pain sessions for future cohorts of providers taking part.

Overall, providers state that they have "been able to apply what [they] have learned about pain management to all of [their] patients". ECHO has made providers "more aware of the psychosocial aspects of pain and the need for a comprehensive approach" and has encouraged them to "refocus patients" to "engage them in a different way of thinking about pain". Per request of leadership at Community Health Center, Inc., who recognized the capacity of ECHO to promote best practices in pain care, the ability to participate in weekly Project ECHO Pain sessions and to access ECHO content via the project website has been extended to Nurse Practitioner Residents and students who practice at CHCI.

Providers participating in ECHO continue to express that the sessions are very useful and feature "cases just like [they] see in [their] practice". Providers new to ECHO have voiced the opinion that the project website is "particularly useful". New and veteran providers specifically mention that the didactics are so helpful that they should be "offered to a larger forum of providers [to allow] more providers to benefit". One provider indicated that she "makes a list of things [she has learned about], to follow up on each week", while another reports that he takes "20 minutes at each staff meeting to discuss what I have learned at ECHO, so my colleagues can learn from it".

Providers state that ECHO has given them "a great knowledge base" and has "empowered [them] to know what is in a patient's best interest". ECHO has encouraged "structural improvement" in providers' practice and improvements in provider confidence levels to make treatment changes. A behavioral health provider reports that "ECHO has helped me structure my interventions more and has encouraged collaboration between medical and behavioral health providers to treat pain.

Satisfaction Scores: Provider satisfaction with ECHO sessions was assessed on a 5-point scale after each ECHO session as part of providers' documentation of session attendance for purposes of Continuing Medical Education (CME) reporting. The mean satisfaction score reported by ECHOists who submitted a CME form after a Pain ECHO session was 4.82 (out of 5.00).

eConsults: Fifteen eConsults were submitted for consideration by the faculty team at the Integrative Pain Center of Arizona. Although providers were given the opportunity to obtain quick feedback on patient cases from the faculty team by using an eConsult instead of making a full presentation during a Project ECHO Pain session, providers overwhelmingly preferred to present patients during ECHO, citing the ability to obtain the opinions of a variety of faculty team members as an impetus to present the case at a live ECHO session. Since relatively few eConsults were returned, there was not sufficient data to conduct separate analysis of the impact of eConsults on providers' treatment of patients with pain.

Discussion:

There is convincing evidence that primary care providers are not well trained or equipped to manage chronic pain effectively. Over-reliance on opioids combined with undervaluing complementary approaches such as behavioral health-based treatment has resulted in an epidemic of prescription opioid abuse and misuse. Our study is significant in that it demonstrated that not only can an educational intervention improve knowledge and self-efficacy, but that it also resulted in measurable and clinically significant changes in practice. The interactive, case-based nature of this intervention was highly effective as demonstrated by the enhanced knowledge scores, self-efficacy scores, and satisfaction scores. But more important and noteworthy is the fact that this knowledge appeared to have led directly to changes in practice. Primary care providers noted specifically that Project ECHO increased their level of concern about opioid addiction and prompted them to adhere more closely to opioid monitoring strategies. Chart review data strongly suggests that these changes led to actual changes in practice. Nearly one in three of all patients whose cases were presented at ECHO had their opioid medications decreased or discontinued while at the same time more patients were referred for behavioral health co-management. These changes did not lead to an increase in pain. Patient reported pain scores remained stable or slightly decreased in the three-month period of follow up post ECHO

presentation. Taken together, these findings demonstrate the potential for a well-designed educational intervention, combining peer-to-peer learning with access to specialty expertise and an interactive format to improve care for a high-risk population of patients with pain.

By improving the capacity of primary care providers to effectively manage pain, this study demonstrates the potential for the ECHO Pain intervention to improve access to quality care for underserved patients. Given the extremely limited access to pain specialty care that most federally qualified health centers experience, these findings are extremely important.

This project demonstrated the potential for simple, easy-to-apply technology to break down barriers between specialists and primary care providers and create a collaborative learning community. With this technology, willing, highly qualified specialists could share their knowledge and expertise with a community of primary care providers located across the country. Our project, initially intended to reach two health centers, was far more successful in extending its reach to practices across the country. At the conclusion of this study, there are over 45 practices from seven states joining weekly ECHO pain sessions. This type of approach is needed to break down silos that exist in the current healthcare system to promote a culture of learning and application of best practices that is less reliant on local or individual expertise and more reliant on sharing and collaboration.

Further research is needed to determine the impact of interventions like this one on longer-term clinical outcomes and on utilization and cost. It is plausible that reduced reliance on opioids and improved adherence to evidence based practices for pain may result in better care that translates into fewer hospitalizations or emergency room visits. It may also result in a reduction in specialty consultations, testing, and imaging. Additional studies will be needed to confirm this possibility. Such work is critical in order to build a financial model to sustain interventions such as ours, especially in light of the substantial cost incurred to produce the Project ECHO sessions and the lost revenue from primary care provider's participation in the weekly sessions.

Conclusions:

Attendance at weekly Project ECHO Pain sessions led to increased primary care provider self-efficacy to treat patients with chronic pain and improved providers' knowledge of pain care best practices. Patients of providers who participated in Project ECHO pain for one year received fewer opioid prescriptions and were increasingly referred to behavioral health, where appropriate. Behavioral health providers who participated in Project Next Steps qualitatively reported an improvement in their knowledge about pain and self-efficacy to treat patients with pain, and demonstrated some improvement in knowledge and attitudes about pain, but did not demonstrate improvement in decision-making regarding pain. Project Next Steps did not utilize a control group or validated surveys for behavioral health provider participants. Further study is needed to determine the impact of participation in Project ECHO Pain on behavioral health providers' knowledge and attitudes about pain and decision-making regarding pain, which should utilize a control group of behavioral health providers, and validated surveys, if possible. Overall, the Project ECHO model has shown to be useful for sharing knowledge and information about the treatment of pain with primary care medical and behavioral health providers in safety net primary care settings, and allowing them direct contact with pain care specialists to provide feedback on difficult patient cases. FQHC providers' improved pain care knowledge and self-efficacy benefit the patients they

see in safety net primary care settings, who are able to receive standard-of-care pain treatment without having to leave their primary care medical home.

taSignificance:

Project Next Steps represents the first replication of the Project ECHO® model by a federally qualified health center, and the first demonstration that the Project ECHO® model, applied to pain, leads to improved patient outcomes among patients being treated for complex chronic pain. Primary care medical providers at FQHCs in Connecticut and Arizona who participated in the Project Next Steps intervention showed significant increases in knowledge about pain, self-efficacy to treat patients with complex chronic pain and increased awareness of the problem of opiate addiction and dependence among patients being treated for their pain with opioid medications. A review of the literature and confirmation from pre-intevention surveys that were part of Project Next Steps indicate that although chronic pain is a prevalent problem, many primary care providers do not feel confident in their ability to manage chronic pain. FQHCs serve as safety-net healthcare providers for medically underserved patients, who may not be able to visit a specialist provider to treat their complex chronic pain, due to issues of time, cost, lack of insurance coverage and inconvenience. Project Next Steps shows that primary care providers at FQHCs can be instructed in the treatment of patients with complex chronic pain via Project ECHO videoconference sessions, which confer information that leads to improved knowledge of pain and self-efficacy to treat patients with complex chronic pain. This enables primary care medical providers to confidently and competently treat pain in primary care. The ability to treat FQHC patients with pain in primary care presents the opportunity for patients to receive care from their primary care provider, eliminating unnecessary and inconvenient trips to see specialist pain care providers.

Implications:

The results of Project Next Steps present evidence that the Project ECHO® model can be applied to improve provider knowledge and self-efficacy and patient outcomes among patients being treated for complex chronic pain. Few published studies detail the results of interventions that utilize the Project ECHO® model. The results described above indicate the potential applicability of the Project ECHO® model to numerous other complex chronic conditions and the need for further investigation of the impact of participation in Project ECHO sessions on provider knowledge of and self-efficacy to treat chronic conditions and on patient outcomes.

List of Publications and Products

Anderson D, Zlateva I, Khatri K, Bifulco, L. The North American Primary Care Research Group (NAPCRG) Annual Meeting, New York, New York. November 21 – 25, 2014. Using Project ECHO to Improve Management of Chronic Pain in Primary Care. Poster (Accepted).

Anderson, D. A New Norm for Health Care: The First Convening of the Global ECHO Community, Albuquerque, NM. September 11-13, 2014. Blazing the Trail: How ECHO Adopters are Kick-Starting and Expanding Their Work. Panel presentation.

Tian T, Anderson, D, Zlateva I, Wang S. *141st American Public Health Association Annual Meeting*, Boston, MA, November 2-6, 2013. Using Large Datasets to Identify and Evaluate Patients with Chronic Pain in a Primary Care Setting.

Anderson D, Khatri K, Tian T. International *Conference on Opioids*, Boston, MA, June 9-11, 2013. Improving the Quality and Safety of Opioid Analgesic Management in Primary Care.

Khatri K, Jepeal N, Anderson D, Zlateva I. *American Telemedicine Association Conference*, Austin, TX, May 5-7, 2013. Implementation of Telehealth Innovations in Primary Care to Improve the Paradigm for Specialty Care Interaction.

References

1. Phelan SM, van Ryn M, Wall M, Burgess D. Understanding Primary Care Physicians' Treatment of Chronic Low Back Pain: the Role of Physician and Practice Factors. Pain Med. 2009;10(7):1270-9.

2. Hutchinson K, Moreland AME, de C. Williams AC, Weinman J, Horne R. Exploring beliefs and practice of opioid prescribing for persistent non-cancer pain by general practitioners. European Journal of Pain. 2007; 11(1):93-8.

3. Zubkoff L, Lorenz KA, Lanto AB, Sherbourne CD, Goebel JR, Glassman PA, et al. Does Screening for Pain Correspond to High Quality Care for Veterans? J Gen Intern Med. 2010;25(9):900-5.

4. Green CR, Wheeler JR, Marchant B, LaPorte F, Guerrero E. Analysis of the physician variable in pain management. Pain Med. 2001;2(4):317-27.

5. Turk DC, Brody MC, Okifuji EA. Physicians' attitudes and practices regarding the long-term prescribing of opioids for non-cancer pain. Pain. 1994;59(2):201-8.

6. Morley-Forster PK, Clark AJ, Speechley M, Moulin DE. Attitudes Toward Opioid Use for Chronic Pain: a Canadian Physician Survey. Pain Res Manag. Winter 2003;8(4):189-94.

7. Arora S, Kalishman S, Dion D, Som D, Thornton K, Bankhurst A, et al. Partnering urban academic medical centers and rural primary care clinicians to provide complex chronic disease care. Health Aff (Millwood). 2011;30(6):1176-84.

8. Arora S, Thornton K, Murata G, Deming P, Kalishman S, Dion D, et al. Outcomes of treatment for hepatitis C virus infection by primary care providers. N Engl J Med. 2011;364(23):2199-207.

9. Katz MH. Golden gate to health care for all? San Francisco's new universal access program. N Engl J Med. 2008;358(4):327-329

10. 29. Sullivan MD, Leigh J, Gaster B. BRIEF REPORT: Training internists in shared decision making about chronic opioid treatment for noncancer pain. J Gen Intern Med. 2006;21(4):360-2.

11. National Center for Health Statistics (US). Health, United States 2006: With Chartbook on Trends in the Health of Americans. Government Printing Office; 2007.

12. Fontaine P, Flottemesch T, Solberg LI, Asche S. Is consistent primary care within a patient-centered medical home related to utilization pattern and costs? J Ambul Care Manage. 2011; 34(1):10-9. [PMID: 21160348]

13. Donaldson MS. Primary care: America's health in a new era. National Academies Press; 1996.

14. International Association for the Study of Pain. Classification of Chronic Pain: Descriptions of Chronic Pain Syndromes and Definitions of Pain Terms. 2nd ed. Seattle, WA: IASP Press; 1994.

15. Chou R, Fanciullo GJ, Fine PG, Adler JA, Ballantyne JC, Davies P, et al. Clinical guidelines for the use of chronic opioid therapy in chronic noncancer pain. The Journal of Pain. 2009; 10(2):113,130. e22.

16. Merskey HE. Classification of chronic pain: descriptions of chronic pain syndromes and definitions of pain terms. Pain. 1986; 1:1.

17. Smith BH, Elliott AM, Chambers WA, Smith WC, Hannaford PC, Penny K. The impact of chronic pain in the community. Family Practice. 2001; 18(3):292-9. HighWire Press

18. Johannes CB, Le TK, Zhou X, Johnston JA, Dworkin RH. The prevalence of chronic pain in United States adults: results of an internet-based survey. The Journal of Pain. 2010; 11(11):1230-9.

19. Landmark T, Romundstad P, Dale O, Borchgrevink PC, Kaasa S. Estimating the prevalence of chronic pain: Validation of recall against longitudinal reporting (the HUNT pain study). Pain. 2012; 153(7):1368-73.

20. Azevedo LF, Costa-Pereira A, Mendonça L, Dias CC, Castro-Lopes JM. Epidemiology of chronic pain: A population-based nationwide study on its prevalence, characteristics and associated disability in Portugal. The Journal of Pain. 2012; 13(8):773-83.

21. Häuser W, Schmutzer G, Hinz A, Hilbert A, Brähler E. Prevalence of chronic pain in Germany: A representative survey of the general population. Schmerz (Berlin, Germany). 2013.

22. Butchart A, Kerr EA, Heisler M, Piette JD, Krein SL. Experience and management of chronic pain among patients with other complex chronic conditions. Clin J Pain. 2009; 25(4):293.

23. American Pain Foundation. Voices of Chronic Pain. 2006.

24. The American Academy of Pain Medicine. AAPM Facts and Figures on Pain. 2011. http://www.painmed.org/PatientCenter/Facts_on_Pain.aspx#refer

25. Tang NK, Crane C. Suicidality in chronic pain: a review of the prevalence, risk factors and psychological links. Psychol Med. 2006; 36(5):575-86.

26. National Sleep Foundation. Sleep in America poll. 2000. http://www.sleepfoundation.org/

27. Verhaak P, Kerssens J, Dekker J, Sorbi M, Bensing J. Prevalence of Chronic Benign Pain Disorder Among Adults: A Review of the Literature. Pain. 1998; 77(3):231-9.

28. Centers for Disease Control and Prevention. Vital Signs: Overdoses of Prescription Opioid Pain Relievers -- United States, 1999-2008. Centers for Disease Control and Prevention Analysis: Morbidity and Mortality Weekly Report. 2011; 60(43):1487-92. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6043a4.htm?s_cid=mm6043a4_w

29. Rittenhouse DR, Shortell SM, Gillies RR, Casalino LP, Robinson JC, McCurdy RK. Improving chronic illness care: findings from a National Study of Care Management Processes in Large Physician Practices. Med Care Res Rev. 2010; 67(3):301-20.

30. Holtrop JS, Jordam TR. The patient-centered medical home and why it matters to health educators. Health Promot Pract. 2010; 11(5):622-8. [PMID: 20817632]

31. Rosal MC, Olendzki B, Reed GW, Gumieniak O, Scavron J, Ockene I. Diabetes self-management among low-income Spanish-speaking patients: a pilot study. Ann Behav Med. 2005; 29:225-35.

32. Shin P, Ku L, Jones E, Rosenbaum S. Analysis of the porposed rule on designation of medically underserved populations and health professional shortage areas. 1-20.

33. Shortell SM, Gillies RR, Siddique J, Rittenhouse D, Robinson JC. Improving chronic illness care: a longtiudinal cohort analysis of large physician organizations. Med Care. 2009; 47(9):932-9.
34. Poleshuck EL, Bair MJ, Kroenke K. Patients Presenting with Somatic Complaints: Epidemiology, Psychiatric Comorbidity and Management. Int J Methods Psychiatr Res. 2003; 12(1):34-43.

35. Sinsky CA. The patient-centered medical home neighbor: a primary care physician's view. Ann Intern Med. 2011; 154(1):61-2.

36. Solberg L, Asche S, Flottemesch T, Averbeck B, Salazar N, Fontaine P. C-B3-01: Medical Homes–Relation to Quality, Cost, and Patient Satisfaction. Clinical Medicine & Research. 2010; 8(3-4):197-204.

37. Solberg LI. How can we remodel practices into medical homes without a blueprint or a bank account? J Ambul Care Manage. 2011; 34:3-9.

38. Starrels JL, Fox AD, Kunins HV, Cunningham CO. They Don’t Know What They Don’t Know: Internal Medicine Residents’ Knowledge and Confidence in Urine Drug Test Interpretation for Patients with Chronic Pain. Journal of general internal medicine. 2012; 27(11):1521-7.

39. Gilfillan RJ, Tomcavage J, Rosenthal MB, Davis DE, Graham J, Roy JA. Value and the medical home: effects of transformed primary care. Am J Manag Care. 2010; 16:607-14.

40. Solberg LI, Asche SE, Fontaine P, Flottemesch TJ, Pawlson LG, Scholle SH. Relationship of clinical medical home scores to quality and patient experience. J Ambul Care Manage. 2011; 34(1):57-66.

41. Phelan SM, van Ryn M, Wall M, Burgess D. Understanding Primary Care Physicians' Treatment of Chronic Low Back Pain: the Role of Physician and Practice Factors. Pain Med. 2009; 10(7):1270-9.

42. Goldberg DG, Kuzel AJ. Elements of the patient-centered medical home in Virginia. Ann Fam Med. 2009; 7(4):301-8.

43. Stange KC, Nutting PA, Miller WL, Jaen CR, Crabtree BF, Flocke SA. Defining and measuring the patient-centered medical home. J Gen Intern Med. 2010; 25(6):601-12. [PMID: 20467909]

44. American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association. Joint principles of the patient-centered medical home. 2007; :1-3.

45. Addington-Hall JM, MacDonald LD, Anderson HR, Chamberlain J, Freeling P, Bland JM. Randomised controlled trial of effects of coordinating care for terminally ill patients. BMJ. 1992; 305:1317-22. [PMID: 1483075]

46. Snow V, Beck D, Budnitz T, Miller DC, Potter J, Wears RL, et al. Transitions of care consensus policy statement: American college of physicians, society of general internal medicine, society of hospital medicine, american geriatrics society, american college of emergency physicians, and society for academic emergency medicine. Journal of Hospital Medicine. 2009; 4(6):364-70.

47. Dobscha, Steven K., et al. "Veterans affairs primary care clinicians' attitudes toward chronic pain and correlates of opioid prescribing rates." *Pain Medicine* 9.5 (2008): 564-571.