

Title of Project:

PainNET - Impact of Developing an Online Professional Learning Community on Chronic Pain Management in the Primary Care Setting

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Inclusive Dates of Project: 1/15/2015-9/15/2016

Acknowledgement of Agency Support: The project described was supported by grant number 5190671 and its contents are solely the responsibility of the authors and do not necessarily represent the official views of Pfizer Independent Grants for Learning and Change.

Grant Award Number: RFP 2014PA2, Request ID 16479397

Structured Abstract:

Purpose: The aim of *PainNET – Impact of Developing an Online Professional Learning Community on Chronic Pain Management in the Primary Care Setting* was to establish an online professional learning community to improve chronic pain expertise in primary care and stimulate interprofessional collaboration.

Scope: Providing effective, evidence-based care for patients with pain represents a significant challenge. The web-based PainNET provider community and Project ECHO® clinics run by Community Health Center, Inc. (CHCI) were utilized to educate FQHC care team members on caring for patients with pain. Access to the PainNET provider community was expanded to a national audience in October 2016.

Methods: A prospective, observational design was utilized. Intervention participants were recruited from practice sites that attended CHCI’s Project ECHO Pain clinics between 1/2015 and 9/2016. Intervention providers attended twice-weekly Project ECHO® Pain sessions and had access to the PainNET provider community. Surveys and focus groups were conducted to assess pain-related knowledge, attitudes, self-efficacy and satisfaction with PainNET.

Results: As of 11/2016, PainNET has 460 registered accounts, 318 active users and 30,000+ page views. Statistically significant improvement was observed in pain-related knowledge from pre- to post- in two cohorts of PCPs who participated in Project ECHO Pain for at least one year and had access to PainNET (Maine, n=12 matched PCPs, 165.5 pre- to 173.3 post-, p<.05; Colorado, n=19 matched PCPs, 159.5 pre- to 175.9 post-, p<.05 [Max Score 250]). Providers in these cohorts were significantly more likely to have improved confidence in their ability to manage chronic pain after having participated in the intervention, (p<.001 for both groups). The majority of respondents to a survey assessing overall satisfaction with PainNET (77%) reported being “Very Satisfied” or “Satisfied” with PainNET overall, as well as with ease of use (75%), contents (78%) and look and feel (75%). Three-quarters of respondents indicated that PainNET was “Very Useful” or “Useful” to their practice.

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

Purpose:

The primary goal of *PainNET – Impact of Developing an Online Professional Learning Community on Chronic Pain Management in the Primary Care Setting* was to establish an online professional learning community that will improve chronic pain expertise in primary care and stimulate collaboration among primary care providers (PCPs) nursing, physical/occupational therapy, pharmacy, and mental health professionals.

- Objective 1 – Establish an interdisciplinary, interprofessional online pain management community to improve knowledge level, competence and adherence to practice guidelines among PainNET providers.
- Objective 2 – Support system-level redesign via increased adoption of pain management best practices in clinics utilizing PainNET.
- Objective 3 – Address existing gaps in patient care by increasing multidisciplinary care.

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

Incidence and Prevalence:

There are over 100 million people in the United States suffering from chronic pain, with a lifetime prevalence of 25-35% in the adult population.^{1,2} This rate is higher than that of other common chronic illnesses such as asthma, diabetes, and depression. Chronic pain is defined as pain lasting beyond the normal time for a disease process or injury to heal, generally agreed to be greater than three months.³ Chronic pain has a significant adverse impact on patients' lives as well as on their families and the wider community, and a serious negative impact on quality of life over the long term.⁴ The average patient with chronic pain 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%).⁵ Adults who suffer from chronic back pain are four times more likely to experience serious psychological distress than the general population,⁶ and twice as likely to be at risk for suicide.⁷ The National Sleep Foundation reports that 23% of adults in America experience substantial sleep disruption due to pain or discomfort.⁸ In general, patients who have chronic pain in addition to other chronic illnesses experience increased disability and poorer health⁴. 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.

The vast majority of patients receive treatment for pain in a primary care setting,⁹ where care is often episodic and brief, with limited resources to support multidisciplinary care. Pain is more common in medically underserved patients,¹⁰ who 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. Primary care providers receive little training in appropriate pain care during medical school or residency. Both providers and patients express dissatisfaction and frustration with pain care. Providers note feeling overburdened, unsupported and unprepared,¹¹ and find encounters centered on pain management frustrating and deeply unsatisfying.¹² Patients seeking treatment for pain often feel stigmatized, distrusted, and misunderstood.¹³

Despite substantial advances in medical care and a range of new pharmacologic treatment options, evidence suggests that 40 to 70% of patients with chronic pain do not receive appropriate care.¹⁴ Guidelines recommend a holistic, multidisciplinary approach to care grounded in the biopsychosocial model and customized to each individual patient. Time pressure, limited resources and minimal training combined with patient and societal expectations that pain should be readily treatable have resulted in an increasing and dangerous over-reliance on pharmacologic treatments. Opioids are the principal medications prescribed for pain and they have been heavily promoted to both physicians and patients as safe and effective. This heavy promotion combined with increased efforts aimed at identifying the presence of untreated pain has resulted in an over 600% increase in their prescribing between 1997 and 2007. Evidence now suggests that their use is associated with a significant, dose-dependent risk of serious harm,¹⁵ with 27,000 deaths from overdose in 2007, according to the CDC. Prescription drug

abuse is the fastest growing drug problem in the US.¹⁶ Studies have suggested that as many as 35% of chronic opioid analgesic users will develop prescription opioid abuse disorder.¹⁷ To combat prescription opioid abuse and diversion, physicians and pharmacists in some U.S. states are now mandated by law to register for access to the state's prescription monitoring program (PMP), and/or to check the PMP when the patients they prescribe to are given a refill on their opiate medication. However, further provider education and support is necessary in order to ensure that patients receive appropriate opioid prescriptions and dosages and that providers feel confident in their ability to manage patients with complex chronic pain using both pharmacological and non-pharmacological treatment methodologies.

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). Novel approaches are needed to ensure that all patients have access to needed consultation and expert specialty care. Community Health Center, Inc., (CHCI) established a Project ECHO Pain clinic in January 2013 to give primary care providers (PCPs) the opportunity to seek evidence-based consultation from pain specialist providers on patients in their panel experiencing complex chronic pain.

Project ECHO® is an evidence-based intervention that connects primary care providers with expert teams of specialist providers via regularly scheduled videoconference.¹⁸ 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 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.¹⁹

Project ECHO Pain sessions occurred via weekly videoconference from 2013-2015, and their impact on the practice behaviors of PCPs and behavioral health providers who attended them was significant. Assessment of a two-year pilot study of CHCI’s Project ECHO Pain teleconference intervention demonstrated improvements in knowledge, attitudes, and adherence to guidelines for the management of patients with chronic pain among providers attending Project ECHO Pain sessions. Chart review data from the pilot study demonstrated a reduction in opioid prescribing and an increase in collaborative management with behavioral health. However, these improvements are limited by the lack of scalability of the Project ECHO model in a safety net primary care setting, due to the time commitment necessary for providers to attend live Project ECHO Pain sessions.

PainNET, an interprofessional provider community dedicated to improving care for patients with chronic pain, was built on existing knowledge about Online Learning (OL). OL facilitates communication and collaboration among professionals of various disciplines and supports care coordination efforts for patients.²⁰⁻²¹ OL technology is easy to use and has been rated favorably by professionals who engage through blogs, chats, forums, and video seminars.^{20,22-23} . OL eliminates geographic and temporal barriers

which can exist with traditional learning methods,^{20-21,24-25} reduces content delivery costs, allows for scalability, and promotes quality improvement.^{24,26} Existing OL programs have demonstrated ability to result in significant knowledge gains that are equal to, if not greater than, traditional learning,²³⁻²⁵ and healthcare professionals apply the evidence-based clinical choices they learn via OL to practice.²⁰⁻²¹ An OL program specific to chronic pain resulted in increased pain assessment and assessment tool knowledge, increased confidence in pain assessment, increased documentation of pain, and had an overall positive impact on clinical practice outcomes.

PainNET was used in combination with twice-monthly Project ECHO Pain sessions to stimulate discussion around: 1) evidence-based methods to improve or advance the standard of care and quality of life for chronic pain patients and 2) best practices on how to implement those methods through team-based care. Through Project ECHO Pain and PainNET, providers had access to individual interactive learning (Project ECHO) as well as a supportive and reinforcing online professional learning community (PainNET). This combined methodology enabled participants to increase their knowledge about pain care and to prepare to make system-level changes at their practices to implement workflows to improve care for patients with chronic pain.

Setting and Participants:

PainNET pilot users included 219 primary care medical providers (PCPs) and behavioral health providers (BHPs) as well as nurses, residents, students, researchers, administrators and care team members from 52 practices in 4 U.S. states that were participants in Community Health Center, Inc.'s Project ECHO Pain clinic as of January 2016. PainNET was launched to a national audience on October 26, 2016. As of 11/2016, PainNET has 450+ registered accounts and 300+ active users from 15 U.S. states, and has received 30,000+ page views.

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Target Audience

- Project ECHO Pain participants and staff members
 - 52 practices across the country
 - 219 medical and behavioral health providers
 - 4 states

Growth

- 300+ active users
- 15 states

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PainNET is run by a team at Weitzman Institute, the research and development arm of CHCI. The team is comprised of 2 co-principal investigators, a Pain Provider Champion, a Project ECHO Pain and PainNET Program Coordinator, the Director of Project ECHO, the Director of Education, a Research Associate, and a Data Analyst and Research Assistant who aggregate and analyze data. The team includes personnel with frontline clinical experience (MDs, RNs), quality improvement and process development experience, program management expertise, website configuration and development knowledge and primary care research capacity. The Program Coordinator is the site administrator and handles new user requests, day-to-day maintenance and updating of the site. The PainNET team at CHCI conducts all content updates and moderates and contributes to the discussion forums and other user-generated content areas of the site. A team of Community Consults specialists who are frontline clinical providers is mobilized to answer peer questions posted to the Discussion Forums and Community Consults areas of the site. The Project ECHO Pain Faculty Team has access to the site, and can contribute resources, content and opinions on all areas of PainNET. In-depth site configuration and page change requests from the PainNET team at CHCI are sent to a third party web development company, which makes the changes to the site's template.

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 ECHO Pain 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 (i.e. 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 care specialists who review and discuss submitted cases and present didactic material on pain-related topics.

Methods (Study Design, Data Sources/Collection, Interventions, Measures, Limitations)

Study Design:

The analysis of knowledge and self-efficacy detailed in this report utilized a pre-post-observational design. Outcome evaluation was designed to measure the extent to which the intervention was adopted. Provider surveys measured knowledge, self-efficacy, adherence to pain management standards of care, and attendance and satisfaction with the intervention activities. Data were collected in a cross-sectional manner at baseline and at the end of the intervention. The time interval between baseline and post-intervention data collection was 14 months for providers in the Maine cohort and 12 months for providers in the Colorado cohort. PainNET satisfaction data was collected from all willing PainNET users in September 2016, at the conclusion of the intervention.

Intervention:

Project ECHO Pain Sessions: Weitzman Institute at Community Health Center, Inc. (CHCI) coordinated and ran twice-monthly Project ECHO Pain sessions via live, interactive videoconference, which were

attended by primary care medical and behavioral health providers participating in the project. The Faculty Team for Project ECHO Pain sessions was comprised of a group of expert pain care providers from IPCA, in Tucson, AZ. The faculty team at IPCA served as a panel of pain care specialists who reviewed and discussed submitted cases and presented didactic material on pain-related topics.

Primary care medical and behavioral health providers were invited to co-present difficult multi-factorial pain-related patient cases to the faculty team at IPCA. Between three and four 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 ECHO Pain attendees were given access to a secure pain provider community website (PainNET) and case submission and presentation forms. 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 pain provider community website.

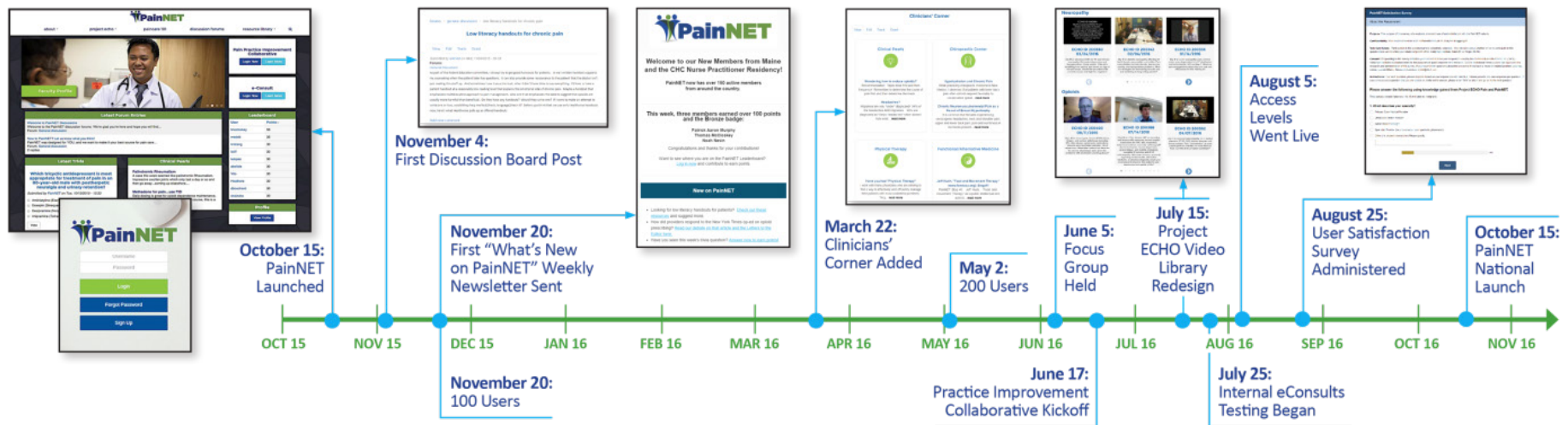
CHCI managed the operational details of organizing each ECHO session's agenda, ensuring that participants were able to connect via videoconference, maintaining a database of operational data (i.e. attendance, Continuing Medical Education [CME], details of presented cases, number of cases presented per provider and participating health center, etc.) and assessed provider knowledge, self-efficacy to treat patients with complex chronic pain and satisfaction with ECHO sessions.

PainNET: All Project ECHO Pain participants were also invited to join PainNET, a web-based interprofessional provider community designed to complement participation in live Project ECHO Pain sessions. PainNET is a flexible, online learning community to engage primary care providers and practices and offer the tools and resources to learn about pain, collaborate with experts, and transform care with evidence-based practices. PainNET includes:

- Project ECHO Pain resource library including archived, categorized video recordings of case and didactic presentations
- A Pain Care 101 section, which presents foundational didactic information for providers treating patients with complex chronic pain
- A discussion forum where primary care providers and specialists answer questions, discuss pain-related topics, and share resources
- A comprehensive resource page with tools, guidelines, protocols, and recommendations
- Specialty-specific blogs
- A community consult forum to receive case-specific recommendations from peers and experts
- Access to information on guideline-informed pain care best practices, quality improvement tools and methodologies and pain practice improvement materials
- Access to electronic consultations (eConsults) from the pain specialty team at IPCA (in progress)

PainNET was launched on October 15, 2015 to 291 pilot users taking part in CHCI's Project ECHO Pain sessions. National access to any interested care team member at any health center nationwide was launched on October 26, 2016. The current PainNET user community includes current and former Pain ECHOists as well as providers and care team members who have never attended Project ECHO Pain sessions, and who only have access to PainNET.

Fig 1. Evolution of PainNET – October 2015-November 2016



Data Sources, Data Collection and Measures:

Data were obtained via provider surveys and operational analytics data from PainNET. Provider-specific outcomes include pain-care knowledge scores and self-efficacy scores.

The following measures were used to evaluate PainNET:

Instrument	Frequency	Who Completes?	Measures What	Method of Administration
(1) 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
(2) Dobscha and Self-Efficacy Survey	Pre and Post	Primary Care Medical Providers (Intervention and Control)	Dobscha Survey: An 11-item measure of primary care medical providers' attitudes and self-efficacy regarding provision of care to patients with pain. Self-Efficacy Survey: A 21-item measure of primary care medical providers' self-efficacy to deliver specific aspects of chronic pain care.	Online via Survey Monkey
(3) PainNET Satisfaction Survey	Conclusion of study – 9/2016	Open to all participants who attended had registered a PainNET	Qualitative evaluation of participant satisfaction with content and usability of	Online via Survey Monkey

		account	PainNET and the value of PainNET to their clinical practice	
(4) PainNET User Analytics Data	Continuously, throughout study	Collected from metadata generated by all participants who had a registered PainNET account	Number of user accounts, number of active users, usage of PainNET as a whole and subpages of PainNET	Collected via Google Analytics of PainNET site

Limitations:

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 and PainNET use:

Project ECHO Pain participation: The 2-hour twice-monthly 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.

PainNET Use: PainNET users, especially frontline clinical providers, expressed that they often did not have time during the workday to access content on PainNET. Though we were unable to address this concern directly, PainNET was available to users at www.painnet.net from any web-enabled device, allowing them to log in with their username and password from any location at any time. Each Project ECHO Pain session included a “PainNET Minute” delivered by the Program Coordinator or Provider Champion to walk users through new content on PainNET, giving them an update on its contents without requiring that they log in. Each week, the PainNET team sends out the “What’s New On PainNET” weekly newsletter to all users, highlighting new content and encouraging new members to join discussions.

Technological Barriers:

Technological barriers included user error with usernames and passwords, and inability to access the PainNET site and externally hosted resources. PainNET users who were unable to remember their usernames or passwords were asked to contact the PainNET program coordinator to have their accounts reset, and were prompted to do so by text on the login page of the site. Some users reported issues logging into the site, related to access to PainNET while on their health center's computer network. These users were asked to contact their health center's information technology helpdesks to request that the site be un-blocked so they could access it as a resource when caring for patients with pain. When the site was first launched, many users were unable to access the tools and resources, as they were hosted on Google Drive, which is often blocked by health center internet systems. To address this concern, all resources are now hosted on PainNET itself, which has alleviated this issue.

Uptake of User-Generated Content Areas of PainNET:

When PainNET was first launched, it had a dedicated discussion board, "Community Consults", which was intended for case-based questions. PainNET users would visit the Community Consults discussion boards to read posts, but the frequency of visits to responses and answers to peers' questions was low. To ensure questions were answered, the PainNET team created a "Community Consults Team", comprised of knowledgeable Project ECHO Pain participants who were active PainNET users and agreed to respond to questions on PainNET. Any time a new Community Consult or discussion board post was posted to PainNET, this team and the expert faculty would be notified and asked to respond.

Website Development Lag:

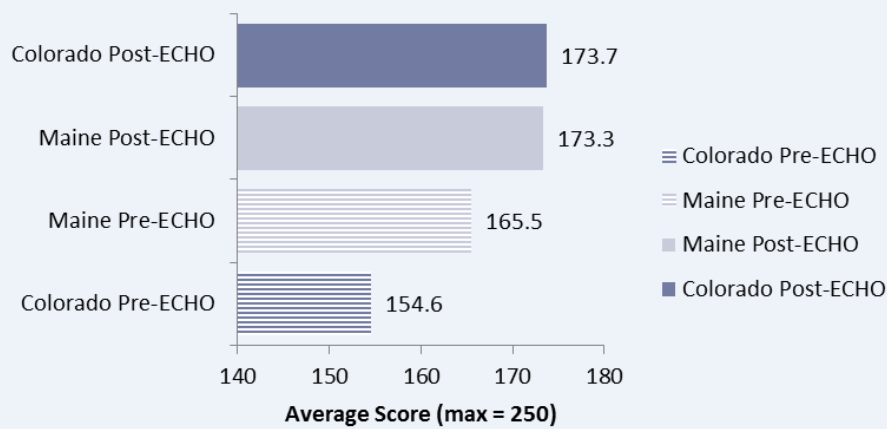
The necessity of working with an external web development company in order to achieve the desired look and feel of PainNET led to a barrier, in that the research team found that our ideas for PainNET came quicker than the ability to implement them. It would often take several weeks to make these changes because the web developers would need to work on a change, then the PainNET team would need to approve layouts which could lead to multiple drafts. It was found that delays in the execution of requested web development changes allowed PainNET users to perceive that the site was updated regularly and was in a state of constant evolution, increasing user interest and drawing users back.

Results (Principal Findings, Outcomes, Discussion, Conclusions, Significance, Implications)

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 in cohorts from Colorado and Maine who participated in Project ECHO Pain sessions for at least one year and had access to PainNET indicated a statistically significant increase in pain management knowledge between baseline and post-intervention (Maine, n=12 matched PCPs, 165.5 pre-intervention, 173.3 post-intervention, $p < .05$; Colorado, n=19 matched PCPs, 159.5 pre-intervention to 175.9 post-intervention, $p < .05$). Total possible KP-50 score is 250 points.

Pain-Related Knowledge



Primary Care Medical Provider Attitudes and Beliefs Regarding Pain: (Dobscha Survey) Results from an 11-item survey that measures providers' self-efficacy, attitudes and beliefs regarding pain^{F1} indicate that after participation in Project ECHO Pain for one year, primary care medical providers in both the Maine and Colorado cohorts were significantly more likely to have improved confidence in their ability to manage chronic pain after having participated in the intervention, ($p < .001$ for both groups). Paired sample t-tests were run and items that were found to be significant are marked with an asterisk in the tables below.

Maine Cohort:

Medical Providers' Attitudes and Beliefs Regarding Pain

Item #	Item	Baseline	Follow Up
1	Skilled chronic pain management is a high priority for me.	5.33	5.33
2	My management of chronic pain is influenced by experience with addicted patients.	2.67	2.44
3	My management of chronic pain is influenced by fear of contributing to dependence.	2.00	2.67

^{F1} The Dobscha survey is an 11 item survey that measures providers' attitudes and beliefs regarding pain, which was adapted from Levin, Berry and Leiter, 1998 (Dobscha, Corson, Flores, Tansill & Gerrity, 2008). Positively worded items are interspersed throughout the survey with a six point response scale ranging from Strongly agree (6 points) to Strongly disagree (1 point) and negatively worded items are measured on a six point response scale ranging from Strongly agree (1 point) to Strongly disagree (6 points). Higher scores are better for all items, with the highest score a 6.0 for all items and the lowest 1.0.

Item #	Item	Baseline	Follow Up
4	I have adequate time to manage most patients with chronic pain.	3.22	2.89
5	Fear of narcotic regulatory agencies/administration influences my decisions regarding chronic pain management.	4.33	3.89*
6	Analgesic side effects hinder my efforts to treat patients with chronic pain.	3.78	3.22
7	Patients I treat become addicted to opioids.	3.89	4.11
8	I use an opioid agreement with my patients.	5.89	5.89
9	I use a pain assessment or monitoring tool.	4.56	5.00
10	I am confident in my ability to manage chronic pain.	3.67	5.00**
11	I am satisfied with the quality of resources available to help me manage patients with chronic pain.	2.78	4.44*

*p<.05 - Paired T-test, **p<.01 - Paired T-test

Colorado Cohort:

Medical Providers' Attitudes and Beliefs Regarding Pain

Item #	Item	Baseline	Follow Up
1	Skilled chronic pain management is a high priority for me.	5.22	5.52
2	My management of chronic pain is influenced by experience with addicted patients.	2.04	2.04
3	My management of chronic pain is influenced by fear of contributing to dependence.	2.27	2.48
4	I have adequate time to manage most patients with chronic pain.	3.24	2.70
5	Fear of narcotic regulatory agencies/administration influences my decisions regarding chronic pain management.	3.67	3.61
6	Analgesic side effects hinder my efforts to treat patients with chronic pain.	3.24	3.65

Item #	Item	Baseline	Follow Up
7	Patients I treat become addicted to opioids.	3.59	4.17**
8	I use an opioid agreement with my patients.	5.61	5.65
9	I use a pain assessment or monitoring tool.	4.82	5.04*
10	I am confident in my ability to manage chronic pain.	4.08	4.96**
11	I am satisfied with the quality of resources available to help me manage patients with chronic pain.	2.73	3.61*

*p<.05 - Paired T-test, **p<.01 - Paired T-test

Primary Care Medical Provider Self-Efficacy Regarding Pain: A 21-item survey was assessed, asking each respondent to rate his or her skills, knowledge or competence on topics related to Project ECHO Pain. Response options range from 1 to 7, with 1 indicating "None or no skill" and 7 indicating "Expert, teach others". Among the cohort of providers from Colorado, increases in self-efficacy were observed for each question from pre-intervention to post-intervention, leading to a statistically significant increase in total score from pre-intervention (92.80) to post-intervention (107.35; p.001; max score 147). Among the cohort of providers from Maine, numerous statistically significant item-level changes were also observed, and there was an overall statistically significant increase in PCP's self-efficacy to manage and treat patients with complex chronic pain between pre-intervention (87.00) and post-intervention (116; p<.001; max score 147).

Maine Cohort:

Medical Providers' Self-Efficacy to Treat Complex Chronic Pain

Item	Baseline		Follow Up	
	Mean	Standard Deviation	Mean	Standard Deviation
1. I am confident in my ability to identify patients who need pharmacological management of chronic pain.	4.1	0.9	5.4**	0.7
2. I am confident in my ability to identify patients who may need a comprehensive approach (rehabilitation, psychological services) to pain treatment.	4.2	1.0	5.9**	0.7
3. I am confident in my ability to assess patients for responsible opioid analgesic treatment.	3.6	2.0	5.6*	0.7
4. I am confident in my ability to understand possible side-effects of most pharmacological medications used for pain.	4.8	1.2	5.9*	0.7

Item	Baseline		Follow Up	
	Mean	Standard Deviation	Item	Mean
5. I am confident in my ability to educate my clinic staff about chronic pain patients.	3.8	1.4	5.9**	0.7
6. I am confident in my ability to assess and manage psychiatric co-morbidities in patients with chronic pain.	4.0	0.9	5.5**	0.7
7. I am confident in my ability to assess and manage substance abuse co-morbidities in patients with chronic pain.	3.8	1.1	5.2**	1.0
8. I am confident in my ability to serve as Consultant within my clinic and in my locality for chronic pain questions/issues.	3.9	1.5	5.6*	1.0
9. I am confident in my ability to explain the risks and benefits of common interventional pain procedures.	4.1	1.5	4.8	1.5
10. I am confident in my ability to determine whether a patient is appropriate for opiate analgesic treatment.	3.8	1.3	5.8**	0.8
11. I am confident in my ability to determine if a patient may benefit from behavioral intervention (psychology or psychiatry).	4.4	1.1	5.7**	0.8
12. I am confident in my ability to work with patients who suffer from chronic pain.	4.1	1.3	5.5**	0.7
13. I am confident in my ability to talk with a patient about chronic pain.	4.1	1.3	5.8*	0.8
14. I think physicians have a responsibility to diagnose and treat patients with chronic pain.	5.0	1.3	5.30	2.0
15. I am confident in my ability to educate other staff members in our clinic about the complexities of issues associated with chronic pain treatment.	3.9	1.2	5.8**	0.8
16. I am confident in my ability to formulate a differential diagnosis for headaches.	4.4	1.9	5.7*	0.7

Item	Baseline		Follow Up	
	Mean	Standard Deviation	Item	Mean
17. I am confident in my ability to treat chronic pain patients with adjunctive medications.	4.1	1.2	5.6**	0.5
18. I am confident in my ability to formulate a differential diagnosis for neck pain.	4.2	1.8	5.0*	1.8
19. I am confident in my ability to formulate a differential diagnosis for low back pain.	4.3	1.8	5.1*	1.9
20. I understand the concept of “equi-analgesic” dosing of opiates.	4.3	1.3	5.6**	1.1
21. I am confident in my ability to communicate effectively with patients and community members about chronic pain.	4.4	1.6	5.2*	1.9

*p<.05 - Paired T-test; **p<.01 - Paired T-test

Colorado Cohort:

Medical Providers’ Self-Efficacy to Treat Complex Chronic Pain

Item	Baseline		Follow Up	
	Mean	Standard Deviation	Mean	Standard Deviation
1. I am confident in my ability to identify patients who need pharmacological management of chronic pain.	4.71	.89	5.43*	.84
2. I am confident in my ability to identify patients who may need a comprehensive approach (rehabilitation, psychological services) to pain treatment.	4.90	.80	5.78*	.80
3. I am confident in my ability to assess patients for responsible opioid analgesic treatment.	4.40	1.29	5.17*	1.37
4. I am confident in my ability to understand possible side-effects of most pharmacological medications used for pain.	4.80	.90	5.30*	1.36

Item	Baseline		Follow Up	
	Mean	Standard Deviation	Item	Mean
5. I am confident in my ability to educate my clinic staff about chronic pain patients.	4.40	1.35	5.04*	1.80
6. I am confident in my ability to assess and manage psychiatric co-morbidities in patients with chronic pain.	4.18	1.30	4.91*	1.08
7. I am confident in my ability to assess and manage substance abuse co-morbidities in patients with chronic pain.	3.98	1.25	4.86*	.76
8. I am confident in my ability to serve as Consultant within my clinic and in my locality for chronic pain questions/issues.	3.86	1.49	4.96*	1.52
9. I am confident in my ability to explain the risks and benefits of common interventional pain procedures.	3.60	1.50	4.30*	1.15
10. I am confident in my ability to determine whether a patient is appropriate for opiate analgesic treatment.	4.24	1.25	5.04*	1.49
11. I am confident in my ability to determine if a patient may benefit from behavioral intervention (psychology or psychiatry).	4.90	.82	5.65*	.93
12. I am confident in my ability to work with patients who suffer from chronic pain.	4.73	.88	5.35*	.88
13. I am confident in my ability to talk with a patient about chronic pain.	4.84	.90	5.74*	.96
14. I think physicians have a responsibility to diagnose and treat patients with chronic pain.	4.45	1.73	5.26*	1.91
15. I am confident in my ability to educate other staff members in our clinic about the complexities of issues associated with chronic pain treatment.	4.22	1.37	5.17*	1.66
16. I am confident in my ability to formulate a differential diagnosis for headaches.	4.51	1.43	4.74*	1.78

Item	Baseline		Follow Up	
	Mean	Standard Deviation	Item	Mean
17. I am confident in my ability to treat chronic pain patients with adjunctive medications.	4.51	1.43	4.91*	1.90
18. I am confident in my ability to formulate a differential diagnosis for neck pain.	4.37	1.40	4.74*	1.81
19. I am confident in my ability to formulate a differential diagnosis for low back pain.	4.53	1.43	4.83*	1.85
20. I understand the concept of “equi-analgesic” dosing of opiates.	4.33	1.61	4.70*	2.05
21. I am confident in my ability to communicate effectively with patients and community members about chronic pain.	4.39	1.19	5.43*	1.61

*p<.05 - Paired T-test

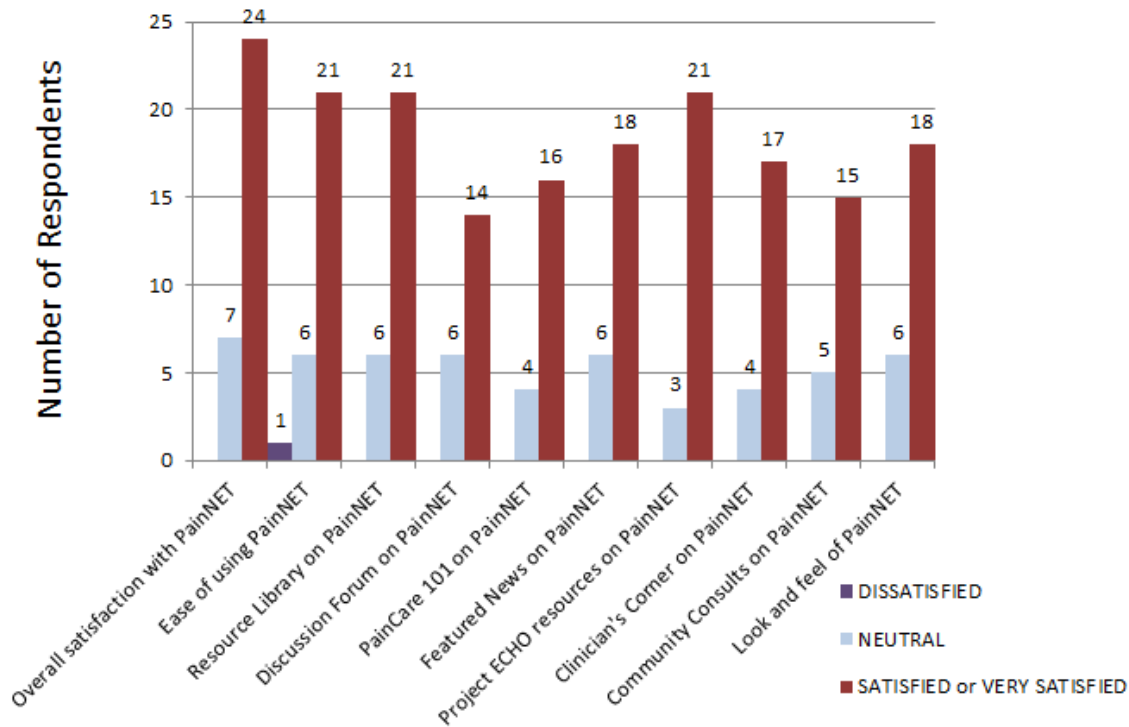
**p<.01 - Paired T-test

PainNET Satisfaction Data:

A custom-developed 10-question survey was sent out to all PainNET users in September 2016, at the conclusion of the intervention period. Users were asked to report on their overall satisfaction with PainNET and its sub-areas. The majority of survey respondents (77%) rated their overall satisfaction with PainNET as ‘Satisfied or Very Satisfied’. Respondent satisfaction was also very high with regard to ease of use (75% “Satisfied” or “Very Satisfied”) and look and feel (75% “Satisfied” or “Very Satisfied”). Three-quarters of respondents indicated that PainNET was “Very Useful” or “Useful” to their practice.

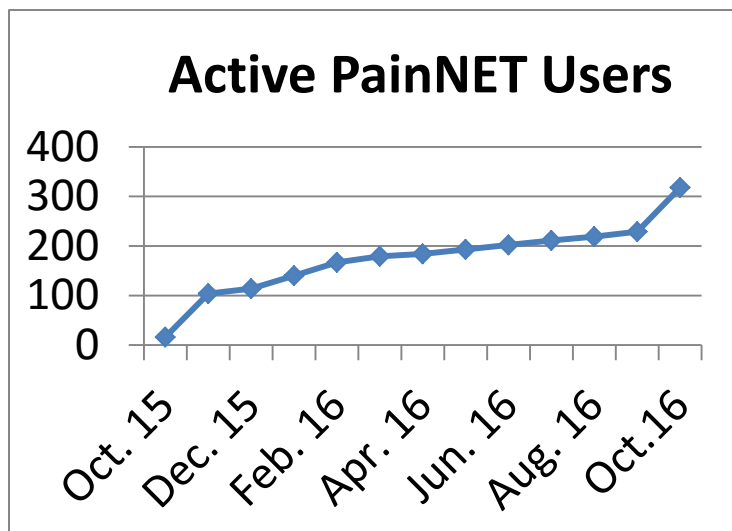
Satisfaction with the content areas of PainNET was very high overall (78% of respondents were “Satisfied” or “Very Satisfied”), with satisfaction with component areas ranging from 70% of users reporting that they were ‘Satisfied’ or “Very Satisfied” with the Discussion Forum to 88% of users reporting that they were ‘Satisfied’ or “Very Satisfied” with Project ECHO Pain Resources available on PainNET.

Satisfaction with PainNET

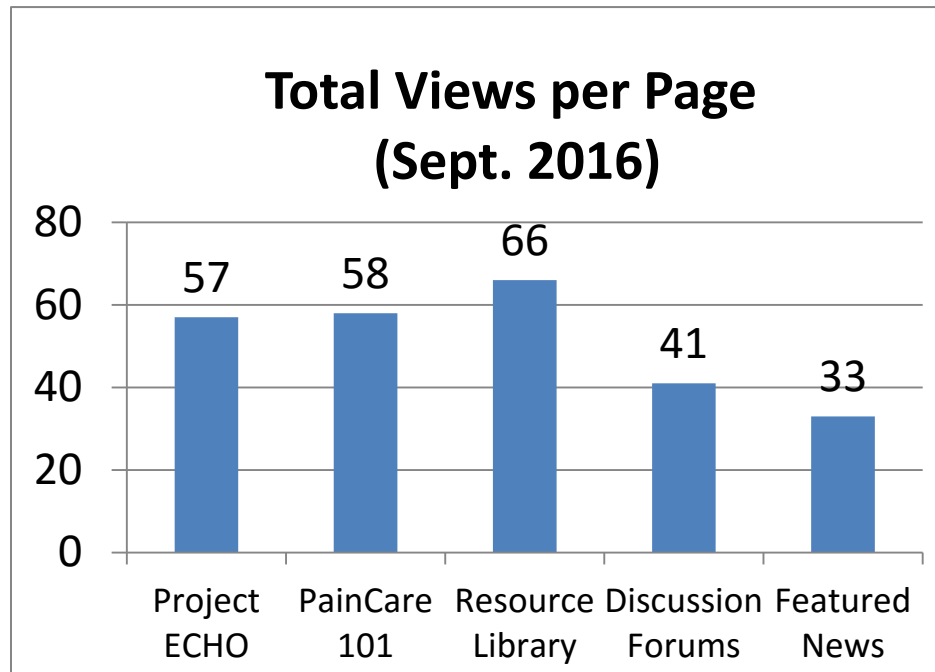


PainNET Analytics Data:

Google Analytics was used to track use of PainNET and its subpages. The most recent data available as of this report reflects that PainNET had 460 registered accounts, 318 active users and 30,000+ total page views during the project period. Over the course of the Project, the PainNET user base grew from Pain ECHOists only to providers and care team members nationwide who are interested in learning to better manage complex chronic pain. Active users were defined as users who registered an account on PainNET and have accessed it at least once during the project period.



Data from September 2016 indicates that the most popular pages among users were the Resource Library page (accessed by 66 users), Pain Care 101 (accessed by 58 users) and Project ECHO Pain Resources (accessed by 57 users).



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.

The research team at CHCI hypothesized that the addition of PainNET, a web-based provider community focused on educating providers to care for patients with complex chronic pain, to the current Project ECHO Pain model would extend access to the content presented at Project ECHO Pain sessions to organizations unable to commit to joining live sessions due to time commitment or time zone. It was envisioned that PainNET would enable care teams to have on-demand access to content presented during Project ECHO Pain sessions and to join the burgeoning community of primary care providers who are interested in adopting best practices for the treatment of chronic pain, and that widespread use of PainNET could maximize the potential for system change by enabling more providers to engage with ECHO content and encouraging collaboration across disciplines, experience levels and geographic boundaries. Our study is significant in that it demonstrated that an educational intervention comprised of direct learning through live Project ECHO Pain sessions and community-based learning through PainNET improved knowledge and self-efficacy among participating primary care providers. This

demonstrates 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 populations of patients with chronic conditions.

Future enhancements for PainNET include the ability to make PainNET even more accessible to users by creating and disseminating a PainNET podcast that would make the content presented at Project ECHO Pain sessions, and captured on PainNET available to users via audio file. PainNET currently includes limited access to integrated Electronic Consultations (eConsults) with the IPCA team for providers caring for patients with pain. This capacity will be expanded in the near future, and is expected to become a fundamental aspect of the PainNET provider community. A pilot test granting access to PainNET and use of eConsults for patients with pain will launch in winter 2017 at a multi-site health center in Arizona where all providers will be trained and onboarded to Pain eConsults, and will have access to feedback from the pain specialty team at the Integrative Pain Center of Arizona. PainNET will continue to be promoted by Community Health Center, Inc. as a resource for providers and care team members interested in improving care for patients with chronic pain. We hope to leverage our relationships and partnerships with national organizations such as the National Association for Community Health Centers (NACHC), Health Resources and Services Administration (HRSA), state and regional Primary Care Associations and telehealth resource sites to further promote and encourage provider use of PainNET and to grow the PainNET provider community.

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 cost incurred to produce Project ECHO sessions and to produce and maintain the PainNET provider community and the lost revenue from primary care provider's participation in Project ECHO Pain sessions during clinical time.

Conclusions:

The combination of attendance at twice-monthly Project ECHO Pain sessions and use of the PainNET provider community led to increased primary care provider self-efficacy to treat patients with chronic pain and improved providers' knowledge of pain care best practices. Further study is needed to determine the impact of use of PainNET alone on provider knowledge and self-efficacy. PainNET is a novel method of educating providers and care team members about pain and granting on-demand access to evidence based methodologies, tools and strategies presented during Project ECHO Pain sessions. PainNET has applicability in safety net primary care settings, where it has the potential to allow providers and care team members to access resource materials about pain and to facilitate 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.

Significance:

The novel combination of the Project ECHO model and the PainNET provider community has the capacity to support providers, interdisciplinary teams, practices and health systems in discussing, utilizing, and adopting best practices in chronic pain management with the ultimate goal of improving care outcomes. The addition of PainNET to the Project ECHO Pain model addresses each of these identified gaps in the transition of knowledge into practice by allowing greater and more flexible access to content, additional forums for interdisciplinary collaboration, expanded venues for sharing care protocols and models, and improved support for system redesign and quality improvement at the practice level. PainNET will serve as a clearinghouse for best practices in chronic pain management and provide practical, actionable support for implementation of those best practices in safety-net primary care settings.

The target audience and direct beneficiaries of this initiative were primary care providers, behavioral health providers, and their care teams from safety-net practice sites in fifteen U.S. states. As a result of the enhanced competency and adoption of evidence-based pain management practices, this project will have a direct and positive impact on the tens of thousands of patients with chronic pain currently being cared for at these practice sites. Through further attempts to spread and sustain PainNET, the impacted audience could grow substantially.

Implications:

The results of the PainNET intervention present evidence that the PainNET provider community can be combined with the Project ECHO® model and 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, and to our knowledge, this is the first intervention to combine the Project ECHO model with a custom-developed provider community. The results described above indicate the potential applicability of an educational methodology combining the Project ECHO® model with web-based provider communities to numerous other complex chronic conditions. The continued success of PainNET as a stand-alone resource will be assessed by the number of new accounts created, number of page views, and provider satisfaction with PainNET. There is a need for further investigation of the impact of participation in PainNET alone on provider knowledge of and self-efficacy to treat chronic conditions and on patient outcomes.

List of Publications and Products from Study:

- Anderson D, Zlateva I, Khatri K. *144th American Public Health Association Annual Meeting*. Denver, CO, October 29-November 2, 2016. PainNET - Developing an Online Professional Learning Community to Improve Chronic Pain and Opioid Management Expertise. Panel Presentation. (Accepted).

- Anderson D, Zlateva I, Porto AM, Bifulco L, Erickson A, Giannotti T, Porto AJ. *Pfizer Independent Grants for Learning and Change - Grantee Face-to-Face Convocation*. Chicago, IL. October 21-22, 2016. PainNET - Developing an Online Professional Learning Community to Improve Chronic Pain and Opioid Management Expertise. Poster Presentation.
- Davis B, Anderson D, Zlateva I, Bifulco L, Giannotti T, Massey K. *Telemedicine & Telehealth Service Provider Showcase (SPS) Advancing Telehealth Partnerships*. Phoenix, AZ, June 21-22. Using Technology to Transform the Management of Pain in Primary Care. Poster Presentation.
- Anderson D, Davis B. *California Telehealth Network Telehealth Summit*. San Diego, CA, April 17-19, 2016. [Transforming Pain Management in Primary Care with Project ECHO](#). Oral Presentation.

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