TABLE OF CONTENTS

    Eve-Lynn Nelson, PhD
    Robert K. Twillman, PhD
    Talal Khan, MD, MBA
    Michael Kennedy, MD
    Melanie Simpson, Phd, RN-BC, OCN, CHPN
    Mary Beth Warren, RN, MS
    Carole Dale Grube, MA
    Janine Gracy, MSE, CHES

  Appendix 3 (Letters of Commitment – Section G)
    Institute for Community Engagement, Ryan Spaulding, PhD
    American Academy of Pain Management, Bob Twillman, PhD
    University of New Mexico Health Sciences Center, Project ECHO, Sanjeev Arora, MD
    Center for Interprofessional Education and Simulation, Kristy Johnston, MSW
    University of Kansas School of Medicine, Office of Rural Outreach, Michael Kennedy, MD

Project Title:

Project ECHO for Pain Management (ECHO-PM): A Technology-Enabled Quality Improvement Approach within a University Health System

Grant ID Number:

21288735

Main Collaborators:

Kansas Partnership for Pain Management, American Academy of Pain Management, University of Kansas Medical Center (KUMC) Health System, KUMC Center for Telemedicine & Telehealth, KUMC Continuing Education/Professional Development, Area Health Education Centers, KUMC Institute for Community Engagement, KUMC Rural Medical Education, KUMC Center for Interprofessional Education and Simulation,

Abstract:

Kansas mirrors the nation in substantial gaps in evidence-based assessment and treatment of chronic pain, including primary care practices affiliated with our University of Kansas Health System. Many of these practices are, or in the process of becoming, Patient-Centered Medical Homes and serve underserved patient in urban and rural settings. Leveraging broad educational activities associated with the Kansas Partnership for Pain Management, this project is the next logical step in a statewide initiative developed from a needs assessment/gap analysis.

The ECHO-PM goals are:
a.) To support practice change and lasting integrative, evidence-based pain management by developing and continuously improving a multi-pronged ECHO-PM curriculum including: (1) American Academy of Pain Management's comprehensive, integrative curriculum; (2) quality improvement curriculum; & (3) interprofessional, team communication curriculum from AHRQ's TeamSTEPPS.

b.) To evaluate the ECHO-PM approach using a waitlist control design, with two cohorts (12 practices/cohort) lasting 8 months each and recruitment across metropolitan and rural sites.

c.) To utilize iterative feedback to refine the approach and finalize an online Project ECHO-PM toolkit, disseminating lessons learned with state, regional, and national audiences.

More specifically, the waitlist control design addresses three aims: Aim 1. To compare the ECHO-PM intervention group to a randomly assigned Waitlist Control in health system affiliated primary care practices. Aim 2. To evaluate the impact of dose of ECHO-PM training on practice and provider outcomes. and Aim 3. To assess the influence of organizational components on ECHO-PM participation.

1. The overarching ECHO (Extension of Community Healthcare Outcomes) Pain Management (ECHO-PM) goals within our health system are:
a.) To support practice change and lasting integrative, evidence-based pain management by developing and continuously improving a multi-pronged **ECHO-PM curriculum including:**
(*1) American Academy of Pain Management's comprehensive, integrative curriculum; (2) quality improvement curriculum from learning collaboratives and practice facilitation; & (3) engaging interprofessional, team communication curriculum from AHRQ's validated TeamSTEPPS.*
b.) To evaluate the ECHO-PM approach using a waitlist control design, with two cohorts (12 practices/cohort) lasting 8 months each and recruitment across metropolitan and rural sites.
c.) To utilize iterative feedback to refine the approach and finalize an online Project ECHO-PM toolkit, disseminating lessons learned with state, regional, and national audiences.

More specifically, the waitlist control design addresses three aims; hypotheses are presented in <u>Section 4.A.1</u>. <u>Aim 1.</u> To compare the ECHO-PM intervention group to a randomly assigned Waitlist Control in health system affiliated primary care practices. <u>Aim 2.</u> To evaluate the impact of dose of ECHO-PM training on practice and provider outcomes. <u>Aim 3.</u> To assess the influence of organizational components on ECHO-PM participation.

Why now? Kansas and the Midwest region mirror the nation in substantial gaps in evidence-based assessment and treatment of chronic pain, particularly in rural and other underserved primary care practices. This is particularly true in the rural setting where there may be no options for thorough interprofessional assessment and treatment in pain management. There are often challenges associated with the rural culture and stigma around disclosing pain/"weakness", seeking help, and utilizing treatment options. The proposed project is the next logical step in a statewide pain management initiative developed from a multi-system needs assessment. This gap analysis was completed over the last two years, with broad healthcare input from academic, governmental, patient advocacy, and private organizations. Because of gaps observed across almost every area of evidence-based pain management, we believe that the proposed intensive "dose" of training and relationship building is essential to promote meaningful and lasting practice change. We aim for 30% improvement on both practice and provider measures of change. These measures encompass the same questions/topics from the gap analysis.

The timing coincides with increasing pressures for prescribers to complete additional training and certification to reflect pain management and decrease risks of misuse of pain medications. Our innovative approach fits health reform priorities such as the patient-centered medical home, including efforts to increase practice-wide competencies in the management of patients with chronic pain as well as improved care coordination. Finally, the ECHO-PM toolkit will be a resource to support providers around Maintenance of Certification goals.

Why augment a Project ECHO approach within the health system? A Project ECHO educational/QI approach fits the call for proposals as the approach connects a team of healthcare experts (e.g., medicine, nursing, behavioral health, pharmacy, allied health professions, others) at the academic health center with health system affiliated primary care

practices. This includes both metropolitan sites focused on the underserved as well as rural preceptor practices. The telementoring approach uses secure, easy-to-use videoconferencing technologies, aiming to "demonopolize knowledge" and improve the capacity of rural primary care practices to provide the same level of care as if the patient traveled to the academic health center. We will extend the Project ECHO methodology by pairing the latest evidence-based pain management curriculum with quality improvement content and interprofessional, team communication training.

Why our team? In response to a comprehensive needs assessment/gap analysis, our Continuing Education/Professional Development partner spearheads a statewide pain management initiative with the input of 30+ member planning committee, including patient perspectives. The statewide initiative provides a strong foundation for the proposed practice performance improvement approach. Through the needs assessment, we have identified a subset of health system-affiliated practices that are interested in more advanced training not only to serve their own patient population, but also to take a leadership role in pain management in their regions.

The statewide initiative focuses on evidence-based, interprofessional educational opportunities for primary care and lays the foundation for the proposed approach (Pingleton, 2015). This existing commitment and investment in a continuum of pain management opportunities will assist in both promoting the proposed project as well as supporting its sustainability. Supported through institutional, state, and foundation resources, **the hybrid-learning model includes multiple reinforcing components that build the foundation for the proposed addition of ECHO training:** 1. Large in-person conferences to lay the educational groundwork; 2. Regional intensive conferences (onsite and virtually) to reinforce topic areas and to provide a "deeper dive" into key areas; 3. Based on previous conference content, enduring online CME/CNE/CE education through a learning platform in order to support learner self-directed learning and to provide clinical practice updates; 4. Practice QI projects, supported through team-building, practice facilitation, and online QI toolkit; and **with the proposed project, 5. Weekly Project ECHO sessions using case-based learning and group problem solving in order to support practice change.**

This strong "dose" of training across onsite, televideo, and online learning options meets the IOM's call for substantially redesigned education in order to achieve the cultural transformation necessary to improve pain management. For example, a recent large in-person conference drew 360 participants from the region. At the follow-up survey, 48% of respondents self-reported that they had implemented changes to "use non-pharmacological treatments to increase function for patients" as well as other steps consistent with national guidelines; over three-quarters of practices reported interest in participating in future training opportunities.

Based on the extensive need in the state as seen in the gap analysis survey, it is crucial to develop these regional pain management leaders in order to improve access and quality of care throughout the state. The relationships developed between the regional leaders and the ECHO expert panel is anticipated to develop a community of practice and comfort level in working together to deliver evidence-based care to patients with pain across the lifespan. As in the

national ECHO program through New Mexico, we anticipate that these ECHO-PM practices will become regional leaders in pain management, in turn supporting and mentoring other health system practices and serving as a resource for patients and their families. This will result in a "force multiplication effect" in which patients are more effectively triaged and limited resources maximized.

2. Technical Approach. Over 100 million Americans are affected by chronic pain, the most common reason for a medical visit, yet care is hindered by limited expertise (IOM, 2011). The contribution of the proposed project will be to develop a replicable and effective method for training teams at rural and other underserved primary care practices to systematically assess and treat chronic pain. This contribution is significant because of the incredible toll untreated pain has on individuals, families, practices, communities, and the nation. This is particularly true as practices face new state and national requirements around opioid prescribing and strive to provide optimum pain control while at the same time minimizing risks associated with prescription drug misuse/abuse. Opportunities to improve pain management are anticipated to increase with healthcare reform's emphasis on primary care practices and the increasing role of primary care as Patient-Centered Medical Homes. The direct benefits of this project are manifold: it will yield tools for enhancing primary care knowledge about pain management as well as system-related team skills to put learning into practice, ultimately improving pain management and patient outcomes. Using telementoring based on best-practice adult learning approaches, the multi-component training approach will develop an innovative, technology-supported method for creating regional capacity in pain management.

Consistent with implementation models (Brownson, Colditz, & Proctor, 2012; Kitson & Harvey, 2015; Stetler, Damschroder, Helfrich, & Hagedorn, 2011), our approach pairs practice facilitation and quality improvement support with evidence-based pain management curriculum. Thus, our proposed program provides the strongest "dose" of education/training that will result in long-lasting practice change. The evaluation results are a crucial step to validate the approach and continue to strengthen ahead of larger rollout. this practice-change interprofessional educational approach has high potential to be replicated across many high need areas, including related areas of pain management (e.g., pediatric and geriatric pain management, cancer pain, etc.).

Developed in New Mexico and now disseminated nationally and internationally, the **Project ECHO™ educational model** develops the capacity of primary care practices to effectively treat chronic, common, and complex diseases in underserved communities. The national ECHO™ program uses "telementoring" to bridge the gap between medical knowledge and primary care practice using established adult learning principles and practice change strategies. The Project ECHO™ model includes the following: utilization of secure, readily available videoconferencing; training in best practices to reduce variation in care; case-based learning; and data tracking to monitor outcomes (Katman, Comerci, & Boyle, 2014; Arora, Geppert, et al., 2007; Arora, Kalishman, et al., 2010, 2011; Arora, Thornton, et al., 2014). Using secure videoconferencing technology, the approach links primary care practices with specialty teams on a regular basis for trainings. During telementoring clinics, trainees listen to brief didactic presentations about the latest evidence-based treatment approaches, and then present de-identified cases from

their current practice to problem-solve treatment strategies with the specialist team and with one another.

Live videoconference clinics are facilitated by an interprofessional team of experts. Continuing education credits (CE/CME/CNE) are earned both for the brief didactics as well as for the case presentations. Additional continuing education options (e.g., pharmacy, psychology, other) will be explored based on the needs of the practices. Although no patient is seen during these telementoring clinics, university-based specialists and primary care providers work together in a community of practice. Primary care providers present de-identified cases and work with the team to implement evidence-based treatment algorithms. This case-based learning approach has been highly effective in developing rural practice capacity to treat chronic conditions, most notably Hepatitis C (Arora, Thronton, et al, NEJM, 2011) and now many other conditions (Arora, Thornton, et al., 2014). To date, Project ECHO has provided more than 57,000 hours of continuing medical education to health care clinicians in more than 300 clinical teams in 74 communities across New Mexico. With Hepatitis C, the first Project ECHO, cure rates among Project ECHO-trained clinicians have been significantly higher than those reported in previous studies of community-based treatments.

The interprofessional experts serve as mentors and colleagues, helping the primary care learners develop expertise as they manage their own patients. Multidisciplinary teamwork is essential to the Project ECHO model. A holistic, integrated team approach ensures comprehensive and effective treatment for patients. This is not telemedicine where the specialist assumes the care of the patient; instead, it is a guided practice model where the primary care provider retains responsibility for managing the patient, with the additional mentoring and support of the Project ECHO team. Thus, Project ECHO participants learn by doing, learn from each other, and learn from specialist teams. Web-based disease management tools facilitate training, and specialists and primary care providers jointly manage patients who are treated right in their home communities. Our proposed project makes use of a disease management model focused on improving outcomes by a) reducing variations in processes of care and b) sharing best practices for pain management. The telementoring model develops enduring competencies and expertise through a cadre of health professionals trained to deliver evidence-based services in their own practices. ECHO clinics for pain management are increasing across the country, in the military, and internationally. Research is emerging from the New Mexico program. From 2010 to 2012, they completed 136 Project ECHO Pain clinics, with 3835 total instances of participation, representing 763 unique individuals from 191 different sites. Sixty percent self-identified as advanced practice nurses or other nonphysician health professional. Statistically significant improvements in participant self-reported knowledge, skills, and practice were demonstrated. Focus group analyses described specific practice improvements (Katzman, Comerci, Boyle, et al., 2014).

3. Need Assessment. Kansas mirrors the nation in substantial gaps in evidence-based assessment and treatment of chronic pain, particularly in rural and other underserved primary care practices. The proposed project is the next step in a statewide initiative developed from a statewide needs assessment/gap analysis completed over the last two years, with broad healthcare input from academic, governmental, and private organizations. University of Kansas Medical Center leaders discussed the need for a Kansas statewide pain management

educational initiative. KUMC met with chief executives of Kansas health-related agencies including the Forum of Kansas Healthcare Agency Executives. There was strong consensus about the need for education to address the issue of chronic pain management and appropriate prescribing and management of prescription medications. Related, the Kansas Medical Mutual Insurance Company and the Kansas Board of Healing Arts both had recently surveyed memberships about educational priorities, and both organizations reported that pain management, including concerns about prescription drug abuse, were the top concerns.

A 30-person interprofessional steering committee and a 19-person expert panel was created to guide a pain management educational initiative. The group quickly was branded The Kansas Partnership for Pain Management and drew on the expertise of leaders in healthcare. The Partnership developed a statewide needs assessment/gap analysis with broad healthcare input from academic, governmental, and private organizations (Kansas Department of Health & Environment; Kansas Association for the Medically Underserved; Health & Human Services Region administrator; Kansas Academy of Family Physicians; Kansas State Nurses Association; Kansas Foundation for Medical Care; Kansas Medical Mutual Insurance Company; Center for Practical Bioethics; Kansas Medical Society; Kansas Hospital Association; Kansas State Board of Healing Arts; Kansas Action Coalition; Kansas Public Health Association; among others). The 22-item assessment received 574 responses that helped determine knowledge and performance gaps of health professionals in Kansas who deal with chronic pain patients. A comprehensive educational approach to translate knowledge into practice around pain management again emerged as the leading priority across primary care providers (e.g., MD/DO, ARNP, PA, others).

The survey was sent electronically broadly to primary care providers and other healthcare providers who see patients with chronic pain, with an 85% return rate. Across respondents (see Table 1), the statewid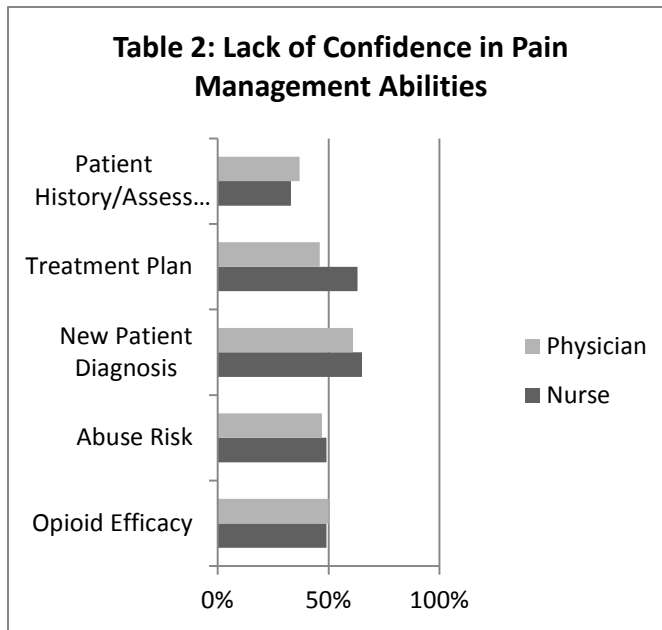e assessment found substantial gaps in evidence-based assessment and treatment of chronic pain, particularly in rural and other underserved primary care practices. While the majority of the responding primary care providers reported confidence in overall diagnosis, they identified gaps in training related to

Table 1: Survey Respondents	Count	Percent
Advanced Practice Nurse	18	3.1
Chiropractor	20	3.5
Dentist	1	0.2
Psychologist or Licensed Counselor	31	5.4
Nurse	40	7.0
Pharmacist	1	0.2
Physician	36	63.1
Physician Assistant	8	1.4
Physical Therapist	14	2.4
Social Worker	41	7.1
Substance Abuse Counselor	19	3.3
Other	19	3.3
Total Responses	574	100.0%

evidence-based assessment, treatment planning, managing abuse risk, and effectively utilizing opioids (See Table 2 below). Furthermore, 61% of physicians and 65% of nurses were not confident in managing a new patient who looked to continue therapy for a chronic pain condition that was diagnosed by a previous provider.

Table 2: Lack of Confidence in Pain Management Abilities

Bar chart showing categories (top to bottom): Patient History/Assess..., Treatment Plan, New Patient Diagnosis, Abuse Risk, Opioid Efficacy. Axis ranges from 0% to 100%. Series: Physician, Nurse.

Practices also reported gaps in a team-based approach to pain management, with 44% of physicians and 37% of nurses reporting using a team-based approach and only 36% of physicians and 37% of nurses reported visiting with family members to gain further understanding of the patient's situation. Less than one-third of respondents reported using a practice-wide pain assessment algorithm and pain management protocols, yet most (61% of physicians and 71% of nurses) responded favorably to the concept. Three-quarters of physicians and nurses also reported that a substance abuse risk assessment protocol would also be useful. The findings reflected overall interest in onsite trainings mixed with reinforcement of educational content using technologies (e.g., archived presentations and other web resources, traditional distance education opportunities). Related to continuing education delivery options, physicians overwhelming chose interactive technology-based options as their preferred method of training, while nurses preferred a mix of online and in-person options. By pairing the proposed technology-based approach with the ongoing statewide initiative, the team anticipates meeting this range of educational delivery preferences. In a related survey, the Institute's department of Rural Health surveyed Kansas critical access hospitals and federally qualified health centers about their highest needs in relation to overall recruitment and retention of providers, and "communication training for our team" was the highest priority.

4. Project Design and Methods. We will employ a randomized Waitlist Control to assess ECHO-PM impact on practice and provider variables, with the goal of iteratively improving the approach. This is an important first step to understanding intervention impact ahead of larger, more costly multi-site trials to assess patient outcome as well as implementation factors.

Recruitment and Site Champions. We will recruit 24 health system-affiliated primary care practices for the ECHO-PM approach, with efforts made to recruit patient-centered medical homes. Potential site champions include physicians, physician assistants, nurse practitioners, nurses, quality improvement specialists, behavioral health staff, or other clinical leaders related to pain management. Participating practices commit to complete a quality improvement project. The program will encourage quality improvement projects that focus on increasing consistent assessment of pain patients with the Patient Outcome Profile from the American Academy of Pain Management (AAPM) or a similar validated tool. Practices will identify at least one champion to attend all activities, with larger practices encouraged to identify two professionals to consistently attend ECHO-PM activities in order to maximize training impact. Broader practice personnel will be strongly encouraged to attend, particularly

related to the team communication and quality improvement/practice facilitation sessions. The champions will be able to support each other in building pain management skills. They also will provide a variety of primary care perspectives on ways to maximize interprofessional strategies and strong communication approaches.

We will employ a Waitlist Control design. Once the 24 practices that meet the inclusionary criteria for practice size have been selected for participation, baseline assessments of the practice and the champion provider(s) will be conducted. Stratified random sampling will be used to assign practices to the first ECHO-PM cohort for the 8-month training course or to the Waitlist Control condition. Strata will be based on average provider knowledge of pain management content and self-efficacy in pain management content scores in an attempt to ensure that the ECHO and Waitlist champions have similar skills. The 12 practices that are in the Waitlist Control condition for the first ECHO-PM cohort will then complete the ECHO-PM intervention as the second cohort. Based on the national Project ECHO and our recruitment of practices committing to a quality improvement project, we anticipate minimal attrition but have conducted power analyses allowing for 20% attrition or 2 practices/cohort. The ECHO-PM three aims and related hypotheses are described below:

Aim 1. To compare the ECHO-PM intervention group to a Waitlist Control in health system affiliated primary care practices.
1-1. Primary Hypothesis –Practice change.
a. ECHO-PM will result in higher practicewide pain management ratings than the Waitlist Control condition.
b. ECHO-PM will result in greater practice progress on quality improvement projects than the Waitlist Control condition.
1-2. Primary Hypothesis – Provider change.
a. ECHO-PM will result in higher knowledge of pain management content scores than the Waitlist Control condition.
b. ECHO-PM will result in higher provider attitude/self-efficacy in pain management scores than the Waitlist Control condition.
c. ECHO-PM will result in higher teamwork ratings than the Waitlist Control condition.

Aim 2. To evaluate the impact of dose of ECHO-PM training on practice & provider outcomes.
a. Greater participation in ECHO-PM components will result in higher scores on the practicewide pain management rating.
b. Greater participation in ECHO-PM components will result in higher completion scores for practice performance improvement/QI projects.
c. Greater participation in ECHO-PM components will result in higher scores on provider measures including knowledge of pain management content, self-efficacy, and teamwork.

Aim 3. To assess the influence of organizational components on ECHO-PM participation.

Waitlist Control: The practices will have the same access to the general statewide pain management initiative opportunities (e.g., large conference, intensives) but not the ECHO-PM components. Data will be collected at parallel times to those of the ECHO-PM intervention group. After the first 8 month cohort has completed the ECHO-PM intervention, the Waitlist Control practices will participate in the second ECHO-PM cohort.

ECHO-PM Intervention: Our ECHO-PM approach is modeled after the national ECHO and will include all key elements. ECHO-PM sessions include a brief evidence-based didactic presentation and collaborative problem solving related to real de-identified cases. The case-based presentations allow adult learners to problem solve around clinical and system challenges together with the expert team and with fellow trainees. This builds not only pain management knowledge, but also the performance skills to apply in practice. Because evidence-based pain management requires learners to acquire and apply a number of new informational and behavior change skills, we propose a comprehensive quality improvement educational package. This innovative approach supports the multiple reinforcing learning experiences that are associated with successful adoption in primary care settings. Champions will participate in an eight-month ECHO, consistent with New Mexico's successful pain management ECHO approach (Katzman et al., 2014).

The project team has already completed Project ECHO™ training in New Mexico and maintain a close relationship through our replication site status. We will deliver weekly ECHO™ training sessions over two 8-month cohorts using Zoom technology. Dr. Nelson's ECHO replication team will assist with ECHO-PM administrative, technical, and data collection protocols to our specific project needs. We utilize national tools including iECHO™, a web-based partner relations management tool that helps manage and audit ECHO™ clinics, collect data on ECHO™ clinic performance, and provide online resources to partners. The ECHO-PM faculty for each session will reflect pain management expertise as well as practice implementation/ continuous quality improvement expertise (Dr. Nelson and Ms. Warren). Additional project faculty will be included depending on the weekly didactics and submitted cases.

ECHO-PM clinics will commence with a didactic session covering evidence-based pain management topic areas, followed by case presentations using well-established Case Study presentation templates. Consistent with the national ECHO™, these sessions will be archived for future participant review in order to reinforce training. Using the videoconferencing bridge, the practices will join each ECHO-PM session simultaneously. Each session will begin with a 15-minute didactic presentation focused on a key treatment component. One-to-two champions will present a case at each ECHO-PM session. Each case discussion will last approximately 20 minutes, with the specialist team focusing discussion on key take-home points related to pain management. This will create ongoing learning communities where the Champions receive support and develop the skills they need for pain management. As a result, they will have the skills to provide comprehensive, best-practice care to patients, right where they live.

The ECHO-PM clinic will be led by interprofessional team of pain management experts and passionate educators. The ECHO leadership team includes the Medical Director (Dr. Khan), Nursing Director (Dr. Simpson), Behavioral Director (Dr. Twillman), and Primary Care Director (Dr. Kennedy). In addition to their expertise, ECHO-PM sessions will reflect expertise

interprofessional practice (Ms. Johnston), and practice performance improvement (Ms. Warren). Depending on the session didactic topic and case presentations, additional expertise will be drawn from pharmacy (Dr. Shrader), family medicine (Dr. Zadke), physical medicine and rehabilitation (Dr. Mitra), psychiatry (Dr. Long), integrative medicine (Dr. Drisko), substance abuse (Mr. Sperling), emergency medicine (Dr. Allin), palliative medicine (Dr. Porter Williamson), neuropsychology (Dr. Kurylo), pediatrics (Dr. Nelson), geriatrics (Dr. Redford), bioethics (Dr. Davis), patient and family support (Dr. Mulhern), cultural influences (Dr. Cupertino), legal (Ms. Sims), practice management (Dr. Spaulding), and other topics of interest. Expert clinicians from other professions, such as occupational therapy, physical therapy, chiropractic, etc. will be identified as the program develops and will be added to the faculty. Dr. Twillman will also liaise with the national Project ECHO™ team and utilize speakers from the well-established team as needed. The hub team will also focus on mentoring practice participants in leadership approaches, including advocating for best pain management practices in their region, as well as resources for patients with chronic pain patients. Their collective expertise spans pain management across ethnicities, geographies, and across the lifespan. In addition, their input and network of contact will be extremely valuable as we disseminate project findings across the region and nation.

The proposed ECHO-PM curriculum will combine three key components. Following an onsite kick-off introducing the trainees to the rationale and foundation of the three areas, the content will be presented through ECHO-PM telementoring sessions and reinforced through practice facilitation. **The first ECHO-PM curriculum component is Pain Management Content from the American Academy of Pain Management (2 ECHO sessions/month).** The AAPM training curriculum will serve as the basis of the ECHO-PM sessions. Consistent with areas of need noted in the needs assessment, these topics include: **Pain Basics, Pain Assessment, Psychology of Pain, Pain States, Pharmacotherapy, Interventions, Integrative Treatment Modalities, Unique Populations, Surgical Approaches to Chronic Pain, Self-care, Regulatory Issues, and Ethics of Pain Management.**

For the ECHO-PM interprofessional communication content, we will adapt AHRQ's nationally recognized *Team Strategies and Tools to Enhance Performance and Patient Safety* (TeamSTEPPS) curriculum for the ECHO-PM sessions (1 ECHO™ session/month). Proposal partner KUMC Center for Interprofessional Education and Simulation Center has had a very successful rollout of TeamSTEPPS internally and is expanding TeamSTEPPS training opportunities across health system sites. TeamSTEPPS focuses on practical strategies to enhance communication competencies required for high-performing teams, including teams address pain management concerns. TeamSTEPPS is composed of four teachable-learnable skills: leadership, mutual support, situation monitoring, and communication.

The third ECHO-PM component is practice facilitation and performance improvement/QI content (1 ECHO session/month), as well as individual virtual consultation with the trained practice facilitation staff. The practices recruited will benefit from this content as they are completing quality improvement projects. Primary care practices, especially in underserved communities, rarely have mechanisms for incorporating new system-based programs into practice, which can slow adoption and sustaining new prevention approaches (Tallia, Stange, et al., 2003; Solberg, Brekke, et al., 2000; Wagner, Austin, et al., 2001; Davis, Thomson, et al.,

1995). Practice facilitation, sometimes referred to as quality improvement coaching, has emerged as a key method for assisting practices in implementing organizational changes and building capacity for continuous quality improvement (CQI).

Utilizing onsite and virtual meetings, practice facilitators promote a culture of learning, practice consensus building, goal setting, and practice performance improvement strategies derived from the learning collaborative breakthrough series, including plan-do-study-act cycles (Parchment, Noel, et al., 2013). In a recent systematic review and meta-analysis, Baskerville, Liddy, & Hogg (2012) found that primary care practices are 2.76 (95% CI, 2.18–3.43) times more likely to adopt evidence-based guidelines through practice facilitation. The Practice Facilitation Core Director Ms. Warren will complete practice facilitation visits as well as availability over technology. Her AHEC department's practice facilitation and learning collaborative/QI efforts have spanned a range of healthcare topics in rural primary care and most recently, patient-centered medical homes. The purpose of the visit will be to identify potential practice changes that will facilitate both participation in the ECHO-PM approach and advance pain management best practices. The steps involved in facilitation include: 1) discussing the flow of pain management identification and treatment during the office visit; 2) identifying barriers to routine identification and treatment delivery; 3) prioritizing barriers in terms of how much they impede care; 4) selecting one or several changes that will facilitate care; and 5) brainstorming possible solutions to remove the barrier.

   5. Evaluation Design. The evaluation will focus on addressing the research questions set forth in the aims above, including questions associated with ECHO-PM process, implementation, and outcome for both practices and providers within the health system.

   Power Analyses: Aim 1-1 involves the comparison of ECHO-PM and Waitlist Control practices after the first 8 month intervention session. Allowing for 20% attrition, we will have at least 10 practices per condition and will be able to detect large effects (d=1.16) for group differences in accreditation ratings and practice progress scores. For aim 1-2 where there will be 2 champions for each program and still allowing for 20% attrition at the practice level, we will have 20 providers in each condition and will have .80 power to detect effects of d=.80 for differences in knowledge, efficacy, and teamwork. A similar ECHO pain management intervention carried out in New Mexico (Katzman et. al., 2014) obtained effect sizes for within person change in knowledge and efficacy of around 1.1 in a large study following a shorter ECHO training seminar. It is reasonable to expect much larger within person changes following 8 months of intervention including practice case review.

   Aims 2 and 3 deal with the extent to which the practices were engaged with the intervention components. These aims are somewhat exploratory in that we have no idea how practice participation/dosage variables will be distributed making a detailed power analysis impossible. Regardless of how many practices are in each participation category, we will be able to conduct descriptive analyses examining mean differences based on participation differences and calculate effect sizes that will be valuable in future interventions of this nature.

Measures:

American Academy of Pain Management (AAPM) Practice Accreditation Rating as measure of practicewide pain management practices: A trained external rater will work with practices to complete the 140 item survey assessing practice components associated with best practices, with higher scores reflected more positive pain management practices.

Practice Performance Improvement/QI Project Completion: An external rater will assess practice progress on the quality improvement project using a one-item scale assessing the project as "Prior to Initiation," "Topic Selection," "Baseline Data Collection," " Testing Change/ PDSA Cycles," "Follow-up Data Collection," and "Completed."

Provider Pain Management Knowledge: Participants will complete the validated 50-item paper-and-pencil Participant Knowledge/Attitudes about Pain Management (KnowPain 50, Harris, Fulginiti, et al., 2008)

Provider Pain Management Attitude and Self-Efficacy: Participants will complete the paper-and-pencil measure from the national ECHO program, the 22-item Participant Attitude and Self-efficacy in pain management (Katzman, Comerci, Boyle, et al, 2014).

Teamwork: Participants will complete the paper-and-pencil measure from the national TeamSTEPPS program, the validated 35-item TeamSTEPPS Teamwork Perception Questionnaire (TPQ, Castner, 2012)

ECHO-PM Training Dose: The program director will tabulate participation in the ECHO-PM sessions and related activities to arrive at a continuous measure of time in activities.

Organizational Implementation: Practices will complete the validated 60-item paper-and-pencil measure, the Organizational Change Manager (OCM). The OCM predicts the likelihood of successful implementation, explains the contributing factors and, when used with the OCM handbook, describes actions that can improve the likelihood of successful implementation and sustained implementation. Fifteen factors regarding the four phases of the OCM change model: Start: Project launch, project champion, senior leader support; Problem exploration: middle manager support, staff needs & support, tension for change, problem exploration, external influence; Solution development: relative advantages, funding, flexibility of design Implementation and testing: implementation plan complexity, staff changes required, work environment, testing & refinement (Gustafson et al., 2003).

Dose of ECHO-PM training: This is an approach across practices regardless of the number of participants in training. Because all champions have committed at the outset to participate in a number of required sessions, we expect little variability in session attendance. There are additional optional sessions offered for champions. Therefore we will create a variable indicating if additional optional sessions were attended or not for each practice. An additional indicator of dosage will be a categorical variable indicating extent of practice staff participating in at least some aspect of the ECHO-PM training. This dosage indicator will be a categorical variable with two or three categories of participation based on how practice participation is distributed.

Data Collection and Management: Data will be collected by the trained evaluation team, uploaded to the KUMC RedCap data system, and then downloaded to SPSS for analysis.

Data Analysis by Aim:

Aim 1. To compare the ECHO-PM intervention group to a Waitlist Control in health system affiliated primary care practices.

Analyses: To address Aims 1-1 and 1-2, data from the first cohort with 10-12 practices in the ECHO-PM condition and 10-12 practices in the Waitlist control condition will be used. Initial analyses will be conducted to determine if there are baseline differences in scores between groups. Depending upon the distribution of the data either parametric tests (t-tests) or nonparametric tests (Wilcoxon-Mann-Whitney) will be used. If there are no baseline differences, posttest scores will be compared between groups using either parametric or nonparametric tests. If there are baseline differences between groups, change from pretest to posttest will be the outcomes used in the comparisons. Effect sizes (d for parametric or r for nonparametric) will be computed for all comparisons.

1-1. Primary Hypothesis –Practice change.
a. ECHO-PM will result in higher practicewide pain management ratings than the Waitlist Control condition.
b. ECHO-PM will result in greater practice progress on quality improvement projects than the Waitlist Control condition.

1-2. Primary Hypothesis – Provider change.
a. ECHO-PM will result in higher knowledge of pain management content scores than the Waitlist Control condition.
b. ECHO-PM will result in higher provider attitude/self-efficacy in pain management scores than the Waitlist Control condition.
c. ECHO-PM will result in higher teamwork ratings than the Waitlist Control condition.

Aim 2. To evaluate the impact of dose of ECHO-PM training on practice & provider outcomes.

Analyses: To address Aim 2, data from both ECHO-PM cohorts will be combined in order to have more power to examine the impact on dose on outcomes. Because the practices in the second cohort may have increased in their pain management skills while waiting to participate in the intervention, changes from immediately pre-intervention to post-intervention will be used as outcome variables. Two sets of analyses will be completed for each outcome, one with the participation variable for the champions and one with the participation variable for the practice as a whole. Changes in scores will be compared across the categories of the participation variables using the parametric or non-parametric tests described in Aim 1 as well as descriptive data. Additionally, within practice effect sizes for the change between pre-intervention and post-intervention scores will be examined for use in the design of other trials.

a. Practices with greater participation in ECHO-PM components will have greater improvement on the practicewide pain management rating.
b. Practices with greater participation in ECHO-PM components will have higher completion scores for practice performance improvement/QI projects.
c. Practices with greater participation in ECHO-PM components will have greater improvement in provider measures including knowledge of pain management content, self-efficacy, and teamwork.

Aim 3. To assess the influence of organizational factors on ECHO-PM participation.

    Analyses: To address Aim 3, organizational implementation scores will be compared across practices based on the categorical dosage variables used in Aim 2. Parametric or nonparametric tests will once again be used to determine if there are organizational score differences across levels of participation. Effect sizes will be calculated as in Aim 2.

    Maintenance: While tracking maintenance is beyond the scope of the 20-month proposal, our team is committed to the ECHO approach. We will continue to monitor outcomes beyond the course of the project as part of the broader statewide initiative. The ECHO-PM approach has proven sustainable in other settings because of its focus on building strong mentoring relationship between peer-to-expert and between peer-to-peer in order to encourage ongoing learning. The enduring practice performance improvement skills also support sustainability by giving practices the tools they need to problem solve and improve processes as new challenges arise and as new clinical best practices emerge. The use of widely available, low cost, secure technologies support project scalability beyond the project course.

    Dissemination Plan: ECHO-PM lends itself to dissemination because of the protocol-driven training, administrative/technical, and evaluation approaches. A train-the-trainer approach is encouraged within and across practices, in which graduating trainees may become mentors to their practices and to new practices adopting ECHO-PM. The ECHO-PM online toolkit is our comprehensive project deliverable. The web tool will be available both through KUMC and AAPM websites, with information about the approach shared widely with the media as well as through the project specific LinkedIn group. We will leverage the ongoing statewide pain management initiative conferences to disseminate findings and tools as well as conferences specific to interprofessional practice and patient-centered medical homes.

Our health system-affiliated sites focus on underserved urban and rural patients with chronic pain, with a number of sites designated patient-centered medical homes. With health care reform, these primary care settings are increasingly charged with ensuring the delivery of high quality pain management, including control of prescription medication abuse/misuse, thus, the demand for the ECHO™ approach will likely increase markedly across the course of the project. We will create and disseminate a Project ECHO-PM toolkit to facilitate replication of the approach in other rural and underserved settings. This will include all clinical, technical/administrative, and evaluation protocols and tools as well as archived content, all available online beyond the course of the project.

An ECHO-PM team of trainer and trainee will jointly present ECHO-PM findings at the annual meeting of the American Academy of Pain Management. The project team will broadly share findings across diverse audiences, through networking, media, workshops, presentations, articles, and publications. On the regional level, we will partner with our Institute for Community Engagement to seek out opportunities to disseminate project findings across the Institute's broader regional activities. In addition, the Center for Telemedicine & Telehealth houses a federally-funded regional telehealth resource center and will seek out dissemination opportunities with its regional partners in Oklahoma and Missouri, with both states already considering ECHO™ replication. The Kansas Partnership for Pain Management members will widely disseminate the toolkit across diverse health sectors and stakeholders. The team will

utilize the findings to approach funders (state agencies, insurers, local and federal funders, others) concerning the potential of the approach to use evidence-based practice in order to decrease the significant individual, practice, community, and state costs related to less-than-optimal care. We will also make training materials available for other institutions that may want to replicate our program. At the national level, we will collaborate with Dr. Twillman and the American Academy of Pain Management to disseminate tools and findings through their network as well as their new learning management system. In addition, the Project Director will share such materials nationally as a member of MetaECHO™, the national ECHO's dissemination network across replication sites, through the monthly televideo calls, online resources, and at the national MetaECHO annual conference.

6. Detailed Work Plan and Deliverables Schedule. Our detailed work plan reflects strong communication and collaboration across all project partners (please see LOS). This includes: the KUMC health system-affiliated sites; the Institute for Community Engagement, including the Center for Telemedicine; the Area Health Education Centers, Continuing Education/Professional Development, and Rural Health; KUMC Center for Interprofessional Education; the American Academy of Pain Management; and the statewide pain management initiative/partners advisory committee in order to successfully develop, implement, evaluate, and disseminate the interprofessional ECHO-PM approach (See Appendix 1 for Detailed Work Plan and Timeline).

During the **Development Phase** the project director will collaborate with the health system leadership and the Kansas Partnership for Pain Management's Advisory Committee to communicate about the new project. ECHO-PM team meetings will support finalizing the timeline with associated tasks/deadlines to progress toward all aims. ECHO trainings and materials will be refined to match our project and all ECHO faculty will be recruited. All sites will be recruited.   The **Implementation Phase** will include two cohorts of 12 practices each completing the ECHO-PM 8-month intervention. Practices will complete baseline and follow-up information. Site Orientation will be completed at each site. Initial and ongoing technical and administrative support will be provided to facilitate participation and fitting the ECHO sessions into the busy clinic environments. During the **Evaluation and Dissemination Phase** data entry, analysis and grant reporting will be completed. Findings will be presented at the American Academy of Pain Management Annual Meeting and other regional and national conferences. The online ECHO-PM Toolkit will be disseminated during this phase.

ECHO-PM Workplan and Timeline

Please note the following acronyms in the Workplan: Project Director (PD), American Academy of Pain Management Lead (AAPM), ECHO-PM Core (Medical, Nursing, ,Behavioral, Primary Care), and Interprofessional Directors (ECHO Team), Continuing Education Core Director (CECD), Practice Facilitation Core Director (PFCD), Relationship Management Core Director (RMCD), Systems Coordinator (SC), Financial Officer (FO)

Activity	*Responsible, Lead Partner Listed First*	Months (2 month intervals)									
		1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20
Schedule twice monthly and as needed leadership team meetings with core directors to evaluate progress toward all aims and reporting requirements. The team will focus on noting and repeating successes and problem solving challenges	PD Nelson, RMCD Gracy, CECD Grube, ECHO Team, PFCD Warren, AAPM Twillman, SC Hooper, FO Sidorenkov	X	X	X	X	X	X	X	X	X	X
Liaise with the statewide pain management initiative, including input from the Partners Advisory Committee	CECD Grube, PD Nelson, RMCD Gracy	X	X	X	X	X	X	X	X	X	X
Consultation with the National ECHO team, including the overall team (Dr. Arora) and the pain management ECHO (Dr. Katzman) and Meta ECHO Dissemination	PD Nelson, AAPM Twillman, RMCD Gracy	X	X	X	X	X	X	X	X	X	X
Utilize existing secure, cloud-based computing solution Zoom to support all ECHO-PM administrative and telementoring needs	PD Nelson, SC Hooper, RMCD Gracy	X	X	X	X	X	X	X	X	X	X

Activity	Responsible, Lead Partner Listed First	Months (2 month intervals)									
		1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20
Develop and implement promotion/marketing approach for recruitment, retention, and toolkit dissemination across written, online, and social media strategies	RCMD Gracy, Communication Manager Velasquez	X	X	X	X	X	X	X	X	X	X
Complete all grant reporting requirements and close communication with the funder	RCMD Gracy, PD Nelson, FO Sidorenkov, Statistician Fleming	X	X	X	X	X	X	X	X	X	X
Participate in the grantee meeting and network with fellow grantees	PD Nelson, AAPM Twillman	X									
With full team input, finalize the administrative/technical, clinical telementoring, and evaluation protocols; develop checklists associated with each protocol	PD Nelson, RMCD Gracy, CECD Grube, ECHO Team, PFCD Warren, AAPM Twillman, SC Hooper, FO Sidorenkov, Statistician Fleming	X	X	X	X						
Develop project-specific information within the iECHO management system and associated iHealth case presentation tool	PD Nelson, AAPM Twillman, ECHO Team	X	X	X	X						
Adapt AAPM credential curriculum for ECHO-PM	AAPM Twillman, ECHO Team	X	X	X	X						
Adapt TeamSTEPPS and other interprofessional training strategies for ECHO-PM	Johnston, RMCD Gracy	X	X	X	X						
Adapt practice facilitation approach and learning collaborative performance improvement materials for the ECHO-PM context	PFD Warren, RMCD Gracy	X	X	X	X						
	ECHO Team, AAPM	X	X	X	X						

Activity	Responsible, Lead Partner Listed First	Months (2 month intervals)									
		1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20
Train core ECHO-PM hub faculty in ECHO Approach, including "mock" ECHOs	Twillman, PD Nelson										
Recruit health system practices for ECHO-PM participation, focusing on metropolitan and rural practices	PFC Warren, Dean of Rural Medical Education Kennedy (See LOC), All Institute for Community Engagement departments Spaulding (See LOC), Statewide Pain Management Initiative CECD Grube	X	X	X	X						
Recruitment and Randomization of 24 diverse practices to the waitlist control design	PD Nelson, Statistician Fleming				X	X					
Baseline data collection	PD Nelson, Data Manager Ko					X					
Complete ECHO-PM Orientation with practices	RMCD Gracy, SC Hooper					X					
Ongoing support and retention of 24 practices	PD Nelson, PFCD Warren, RMCD Gracy					X	X	X	X	X	X
Ongoing technical support before, during, and after ECHO-PM sessions	RMCD Gracy, SC Hooper					X	X	X	X	X	X
Complete practice facilitation sessions across the two cohorts	PFCD Warren, RMCD Gracy					X	X	X	X	X	X
Provide administrative support for ECHO-PM sessions, including case-based presentations	RMCH Gracy					X	X	X	X	X	X
Complete weekly ECHO-PM sessions with core faculty and ad hoc faculty, depending on the weekly didactics and the case presentations	ECHO Team, PD Nelson, RMCD Gracy, CECD Grube, ICD Johnston, PFCD Warren, SC Hooper					X	X	X	X	X	X

Activity	Responsible, Lead Partner Listed First	Months (2 month intervals)									
		1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20
Accredit and award certificates for ECHO-PM participants	CECD Grube					X	X	X	X	X	X
Gather practice and provider measures, both from each ECHO session and at the beginning and conclusion of each Cohort	PD Nelson, RMCD Gracy, Data Manager Ko, Statistician Fleming			X	X	X	X	X	X	X	X
Data entry, analyses, and summarizing results; considerations of next ECHO-PM research directions	Data Manger Ko, PD Nelson, RMCD Gracy, Statistician Fleming				X	X	X	X	X	X	X
Utilize findings, across process and outcomes, in order to revise all protocols and finalize the ECHO-PM online toolkit	PD Nelson, RMCD Gracy, CECD Grube, ICD Johnston, ECHO Team, PFCD Warren, AAPM Twillman										X
Widely disseminate the online toolkit through networking, media, workshops, presentations, and publications	PD Nelson, RMCD Gracy, CECD Grube, ICD Johnston, ECHO Team, PFCD Warren, AAPM Twillman										X
Present process, implementation & evaluation data at the AAPM Annual Meeting, the MetaECHO conference, and other regional/national venues	PD Nelson, RMCD Gracy, CECD Grube, ICD Johnston, ECHO Team, PFCD Warren, AAPM Twillman										X