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TelePain: Primary care chronic pain management through weekly didactic and case-based telementoring

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ABSTRACT

Chronic pain is a significant problem among military personnel and a priority of the military health system. The U.S. Army Surgeon General's Pain Management Task Force recommends using telehealth capabilities to enhance pain management. This article describes the development and evaluation of a telehealth intervention (TelePain) designed to improve access to pain specialist consultation in the military health system. The study uses a wait-list cluster controlled clinical trial to test: 1) effectiveness of the intervention, and 2) interviews to assess barriers and facilitators of the intervention implementation. The intervention involves a didactic presentation based on the Joint Pain Education Curriculum followed by patient case presentations and multi-disciplinary discussion via videoconference by clinicians working in the military health system. A panel of pain specialists representing pain medicine, internal medicine, anesthesiology, rehabilitation medicine, psychiatry, addiction medicine, health psychology, pharmacology, nursing, and complementary and integrative pain management provide pain management recommendations for each patient case. We use the Pain Assessment Screening Tool and Outcomes Registry (PASTOR) to measure patient outcomes, including pain, sleep, fatigue, anxiety, and depression. This article reports some of the challenges and lessons learned during early implementation of the TelePain intervention. Weekly telephone meetings among the multisite research team were instrumental in problem solving, identifying problem areas, and developing solutions. Solutions for recruitment challenges included additional outreach and networking to military health providers, both building on existing relationships and new relationships.

1. Introduction

Chronic pain is a significant problem among U.S. military personnel. Approximately 44% of active duty military personnel experience pain following return from deployment, compared with 26% of the general public who experience chronic pain [1]. Pain due to injuries, sustained both on and off the battlefield, is a leading cause of short- and long-term disability among military personnel [2–4]. Diagnosis and treatment of pain among the military population can be challenging due to common comorbid conditions such as traumatic brain injuries, pre-concussive syndrome, post-traumatic stress disorder, and behavioral health disorders [5].

To address this problem, the Military Health System has made chronic pain management a priority. In 2009, the U.S. Office of the Army Surgeon General chartered the Pain Management Task Force (PMTF) to develop a comprehensive pain management strategy [6]. The PMTF's 2010 final report identified 109 recommendations to be implemented, in phases, across the continuum of military medical care to improve pain management. These recommendations incorporate multimodal and interdisciplinary pain strategies and formed the basis for the U.S. Army Comprehensive Pain Management Campaign Plan [7]. The plan defines several goals and objectives including identifying and implementing standards for training and pain care.

The plan also recognizes that by partnering with the Department of Defense, the Department of Veterans Affairs network, and civilian and academic institutions, they can leverage expertise in improving pain care within the military health system. One example is having pain management specialists at academic institutions use videoconferencing technology to provide pain consultation to health care providers. The PMTF recommends expanding this and other uses of telehealth to

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improve pain care regardless of geographical location. The goal of telehealth is to increase the knowledge, confidence, and pain management skills of primary care providers (PCPs). Telehealth's benefits to PCPs have included satisfaction and learning about best practices without having to travel to medical conferences [8–10]. One successful telehealth model using provider to provider consultation and professional education is Project ECHO (Extension for Community Healthcare Outcomes) [11]. The Project ECHO model has been used to provide a clinician-to-clinician educational forum on pain management —ECHO Pain (Chronic Pain and Headache Management TeleECHO Clinic)—on best pain management practices [9]. In 2012, the Army adopted the Project ECHO model to deliver pain management consultation and education throughout the U.S. Army Medical Regional Commands.

At the University of Washington (UW) in Seattle, a telehealth intervention for improving chronic pain care (TelePain) was first implemented in 2006 and merged with Project ECHO in 2011 [12,13]. TelePain has been found to improve quality of life for patients with chronic pain [14]. For this study, the TelePain intervention provides pain management consultation for military PCPs at the Madigan Army Medical Center (MAMC) on Joint Base Lewis-McChord in Tacoma, Washington, other sites located in the Western Regional Medical Command, and the Veterans Administration Puget Sound Health Care System.

1.1. Research question

The purpose of the Military TelePain study is to test the effectiveness of the telehealth intervention for chronic pain management in providing expertise to (1) help military PCPs deliver safe and effective pain management care and (2) improve military patients' abilities to self-assess and manage chronic pain symptoms at home.

2. Overview of study

2.1. Methods

Study Design. This study uses a wait-list cluster controlled clinical trial with mixed methods to evaluate the TelePain intervention for chronic pain management. The aims of the study are to (1) evaluate the effectiveness of TelePain on pain impact among military patients after 2 months of participation; (2) evaluate the effectiveness of the intervention on quality of life, anxiety, depression, fatigue, and constipation among patients at 2 months; (3) evaluate the effectiveness of the intervention on PCP knowledge and attitudes regarding pain and on PCPs' perceived competence in treating symptoms after completion of the study; (4) describe the pain management patterns of use, strategies, and experiences of military patients; and (5) describe the barriers and facilitators to implementation of the TelePain intervention. All study procedures were approved by the UW Institutional Review Board.

At study entry, PCPs and their patients are assigned by a nonrandom method to either the intervention or the wait-list control arm. PCPs who are designated as Army Primary Care Pain Champions or pain management experts at MAMC are assigned to the intervention arm. PCPs who are not designated pain champions are also eligible to participate in the intervention arm if they agree to present at least one of their patients during a TelePain session. An equal number of matched PCPs are assigned to the control arm. To prevent contamination, control providers are not from the same clinic as intervention providers. Patients are assigned to the same arm as their PCP. Patients remain in the study for 12 weeks; PCPs participate in the study until all of their enrolled patients complete the study activities.

The study aims to enroll 24 PCPs and 120 patients. A power calculation was performed using *Optimal Design for Multi-level and Longitudinal Research* [15], which allows for the clustering of providers and patients. Because sample size requirements will be the largest for cross-sectional, clustered analyses and the primary analyses are clustered, we estimated sample sizes for those analyses. Estimates are based on the following assumption: (1) an intraclass correlation coefficient of 0.20; (2) an average cluster size of 8, assuming an average of 8 patients per provider; (3) a small effect size of 0.20; and (4) alpha of 0.05. With a sample size of 120 patients, we have power of 0.80 to detect the small effect size of 0.20.

Provider Participants. PCPs include physicians, physician assistants, and nurse practitioners caring for patients diagnosed with chronic pain. For this study, PCPs meet with the research team and provide consent after reading the study information statement. Study measures are completed at this time and at the end of the study.

The participating PCPs identify eligible patients in their caseload using the following criteria: (1) at least 18 years of age, (2) have been diagnosed with chronic pain, (3) have a pain score that is 2 or higher on a scale of 0–10, (4) have functional fluency in English, (5) have no or only mild cognitive impairment, and (6) have no problems communicating by phone because of hearing assistive devices. The research team also identifies potentially eligible patients from the MAMC opioid prescription database. PCPs receive a $100 gift card for each patient who agrees to participate in the study. (In accordance with Department of Defense regulations, PCPs have to complete study surveys during non-duty time in order to be eligible for the gift cards.) PCPs in the intervention arm also receive free continuing medical education (CME) credits after participating in a study-related TelePain session.

Patient Participants. Members of the research team contact potential patient participants by phone to confirm eligibility. If the patient is eligible, the team member reads the consent form, answers any patient questions, and obtains and documents the patient's agreement to participate in the study. Patients who agree to participate complete baseline questionnaires by phone and then receive instructions on how to complete the online Pain Assessment Screening Tool and Outcomes Registry (PASTOR) assessment. Both intervention and control patients report their symptoms every 2 weeks for 8 weeks and then one more time at 12 weeks. All patients receive a $50 gift card after completing the baseline survey and a $50 gift card after completing the survey at the end of study, if they completed their surveys on non-duty time.

3. Description of the intervention

The TelePain intervention is provided through low-cost, commercially available technology and has two components: (1) military PCPs receive pain management recommendations for pain cases through video case conferences with other participating PCPs and external pain and symptom management experts, and (2) military PCPs attend a didactic presentation based on the Joint Pain Education Program Curriculum [16].

The goal of the intervention is to use case-based learning to (1) improve PCPs' ability to manage complex pain cases, (2) support evidence-based practice, and (3) demonstrate an interdisciplinary pain management approach. Case conferences by videoconference are provided weekly for 90 min and includes expert pain and symptom management consultants from the military, Veterans Administration, and UW. The consultants' expertise span pain medicine, internal medicine, anesthesiology, rehabilitation medicine, psychiatry, addiction medicine, health psychology, pharmacology, nursing, and complementary and integrative pain management. PCPs can interact with the consultants and with other participating providers during the TelePain session. Brief didactic presentations on chronic pain care topics are also provided during the sessions based on the Joint Pain Education Program Curriculum (see Table 1) [16]. The curriculum was identified through a collaborative effort between the Department of Defense and the Department of Veterans Affairs and addresses a wide variety of pain problems and therapeutics.

In the intervention arm, PCPs present each participating patient's de-identified clinical case at a TelePain session within the first 4 weeks of the patient's study enrollment and again at the end of the patient's

Table 1
Joint pain education program curriculum.

1.1	Understanding Pain
2.1	Modern Understanding of Pain
2.2	Pain Taxonomy and Physiology
2.3	Department of Defense/Veterans Health Administration Stepped Care Model for Pain Care Recovery
3.1	Assessment of Pain
3.2	Assessment Tools
4.1	Acetaminophen, NSAIDS, and Opioids
4.2	Adjuvant Medications
5.1	Chronic Opioid Therapy Risk Evaluation and Mitigation
6.1	Behavioral management of Chronic Pain
6.2	Provider Communication in Chronic Pain
7.1	Physical Based Therapeutic Approaches to Pain Management
8.1	Integrative Pain Management
9.1	Pain Medicine Specialty Care
10.1	Neck Pain
10.2	Acute Low Back Pain
10.3	Chronic Low Back Pain
11.1	Shoulder Pain
11.2	Hip Pain
11.3	Knee Pain
12.1	Myofascial, Connective Tissue and Fibromyalgia Pain
13.1	Central Neuropathic Pain
13.2	Peripheral Neuropathic Pain
14.1	Headache Pain
15.1	Visceral Pain
16.1	Psychiatric Comorbidities and Pain
17.1	Geriatric Pain
17.2	Palliative and Oncologic Pain Care
18.1	Women Pain Related Issues
18.2	Opioids and Pregnancy
18.3	Female Pelvic Pain

study participation. The PCP submits patient information to the expert consultants in advance of the session. The information consists of the patient history (including diagnosis, current medical issues, and current symptom management issues) and specific questions for the consultants.

The expert pain and symptom management consultants make recommendations for difficult symptom management issues and suggestions for using evidence-based guidelines for pain management. Recommendations include behavioral, lifestyle, and pharmacological strategies. The latter focus on minimizing side effects and maximizing symptom control. The expert consultants follow up with a faxed or emailed summary of recommendations to the participating PCP that includes how to use the evidence-based guidelines for pain management recommendations. This ensures documentation of advice and continuity of care, as well as helps maintain PCP engagement in implementing the recommendations.

3.1. Study measures

Provider Outcomes. The PCPs complete the KnowPain-12 questionnaire [17], the Knowledge and Attitudes Survey Regarding Pain [18], and the Perceived Competence Scale [19] at baseline and after all their patients complete the study, at approximately 3 months. In addition, PCPs complete the KnowPain-12 questionnaire and the Perceived Competence Scale quarterly to receive CMEs for participation in the TelePain sessions. This allows us to track change in pain knowledge and competence over time for those PCPs who continue to attend the TelePain sessions.

Patient Outcomes. The patient is asked to report their symptoms by phone with the research team at 2, 4, 6, 8 and 12 weeks using the PHQ-4 [20,21], the Pain Intensity, Enjoyment of Life, and Interference with General Activity (PEG) Numeric scales [22], and items addressing analgesic side effects, number of “bad days” when more medication than is prescribed was needed, and treatment satisfaction [23]. After the call, the patient goes online to complete the PASTOR assessment which is a 20- to 30-min survey that provides for clinicians a comprehensive three-page report of the patient's chronic pain experience [24]. PASTOR was developed as a direct result of the PMTF recommendations; it is designed to provide an outcomes registry to improve evidence-based decision making by health care providers and to facilitate pain research. PASTOR uses the National Institutes of Health Patient-Reported Outcomes Measurement Information System (PROMIS) to obtain data on a wide range of pain-related areas. Questions are administered by computer-adaptive testing to allow for precision with the fewest possible number of questions. Scores in pain-related areas such as sleep disturbance or physical function are obtained in as few as 4 to 6 questions each without losing the precision of a lengthier questionnaire. PASTOR includes validated assessments of pain intensity, pain quality, pain interference, physical function, sleep, anxiety, depression and anger, post-traumatic stress disorder, opioid misuse and abuse, alcohol abuse, and social role satisfaction.

Patient and PCP Interviews. The research team conducts semi-structured interviews by phone with each of the PCPs in the intervention arm at the end of the study to better understand the barriers and facilitators to participating in TelePain. A subgroup of 30 patients also participates in semi-structured interviews by phone to provide the researchers with an in-depth understanding of their chronic pain experience and treatment.

3.2. Overview of analytic approach

All analyses will be based on the intent-to-treat principle. We will use mixed-effect models using hierarchical linear modeling to analyze patient and provider outcomes [25,26]. The primary patient outcome variable will be average pain impact [27] in past week, as reported on PASTOR, measured at week 8. The patient model will include a random provider effect and a fixed group effect.

Provider models will compare the two treatment arms on provider knowledge and attitudes regarding pain, providers' perceived competence in treating symptoms, and the KnowPain-12 questionnaire responses as measured at the end of the study, controlling for the baseline value of that measure as a covariate. Providers in the control arm, after completing the study, will have an opportunity to participate in the intervention. A random provider effect will be included to account for possible multiple outcomes per provider. Analyses will be supplemented with a secondary analysis based on received treatment (i.e., providers and their patients in the intervention arm who do not receive the intervention as planned will be placed in the control arm).

Patient and PCP interviews are transcribed verbatim by a transcriptionist. Each transcript is read by two research team members to identify codes for text that capture key thoughts or concepts. Codes are then organized by theme to provide an understanding of the patient's chronic pain experience and PCPs' perceptions of the barriers and facilitators to participating in TelePain. Direct quotes exemplifying key ideas and concepts are identified. These findings will enhance the quantitative findings.

4. Discussion

4.1. Challenges and lessons learned

Thus far, challenges faced during the study have been related to patient and provider enrollment, patient case presentations at the TelePain sessions, and technical and logistical issues related to TelePain delivery. Enrollment of intervention PCPs is facilitated by MAMC's established role of Army Primary Care Pain Champions: each pain champion has designated time on his or her schedule to attend the TelePain sessions. The majority of the providers in the intervention arm are pain champions who are interested in attending TelePain sessions and learning about pain management because it supports their role as a pain champion. Enrollment of providers in the control arm is more

challenging and requires more persistence and outreach. It helps that some members of the research team have worked in primary care at MAMC and have established relationships with MAMC PCPs. These connections are instrumental in securing provider participation and support for the study.

The provider and patient incentives described previously were not approved until after the study enrollment process began. While the incentives do appear to improve patient and provider willingness to participate in the control arm of the study, they do not significantly affect enrollment in the intervention arm. Providers in both arms receive PASTOR reports, which many providers find helpful in evaluating their patients and in guiding care. Providers in the control arm report that their patients with chronic pain who enroll in the study call and/or visit the clinic less frequently during the study period. Many patients who are enrolled in the control arm share with the research team that they look forward to their weekly calls.

We have found it easier to enroll patients in the intervention arm than in the control arm because the PCPs participating in the intervention identify each eligible patient on their panel and discuss the study with the patient before the research team contacts the patient. Patients in the intervention arm report that they like having their cases presented to the interdisciplinary team and are very interested in the recommendations. However, a small number of intervention patients were not happy with the recommendations and withdrew from the study.

Initially, once a provider in the intervention arm identifies an eligible patient, a member of the research team immediately contacts the patient, the patient provides consent, and then is enrolled. Yet, the provider may not always be ready to present the patient's case at a TelePain session. In these circumstances, these patients do not have their cases presented until weeks later. Delayed presentations do not allow sufficient time for the provider to initiate the interdisciplinary team's recommendations before the patient completes his or her 12 weeks of study participation. We learned to correct for this by coordinating with the providers and scheduling each patient's case presentation date prior to contacting the patient for consent and enrollment.

Intervention providers have been initially reluctant to present their patients at the TelePain sessions due to feeling uncomfortable in presenting to their peers or not having the time to prepare for the presentation. We thus begin to engage with providers weekly, building rapport, offering support, and establishing goals for patient enrollment and provider presentations. Research staff also assist providers in the intervention arm by reviewing patient charts, preparing study patients' paperwork for presentation, and helping providers with their case presentations when needed.

Identifying patients to enroll in the control arm remains a challenge. Initially, PCPs in the control arm were asked to identify patients on their panel who had chronic pain and might be appropriate for the study, and this yielded some results but was not sufficient in generating enough study participants. We began to use the MAMC opioid prescription database to identify patients with chronic pain on control arm providers' panels and then provided a list to each provider monthly for review. Members of the research team also cold-called patients from this list, and these calls have yielded modest results.

Technical issues have also resulted in challenges; for example, the online system used for provider enrollment and end-of-study questionnaires, was difficult to access at times and did not consistently store the data entered at MAMC (we believe this was due to firewalls at MAMC). We made adjustments by having the providers complete their questionnaires offline and forward them to the research team for input into the online system. For patient data, at the conclusion of each phone call with the research team, the patient receives a verbal reminder and an email reminder to complete PASTOR online. However, the research team does not have an easy way to track whether the patient completes PASTOR within the window of time specified.

The TelePain sessions take place at two sites on two different days—Wednesdays at the UW and Thursdays at MAMC. Participating study PCPs and pain and symptom management experts from the military and the UW connect to TelePain remotely. We have experienced connection challenges as well as difficulties ensuring that the necessary experts are available at each site. Addressing these challenges required coordination, advance planning, and clear expectations.

5. Conclusions

This study of use of the TelePain intervention for the Military Health System is complex: it involves complicated chronic pain patients, busy PCPs, diverse military and academic sites, and multiple providers at each of these sites. Challenges faced in implementing this intervention have been overcome with outreach, networking, building on existing relationships, and building new relationships. Weekly telephone meetings between the UW and MAMC research teams have been instrumental in problem solving, identifying problem areas, and working on solutions.

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