

Improving Shoulder Assessment Skills in Primary Care Providers of Active-Duty Service

Members at Fort Hood, TX.

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Abstract

Project Title: Improving the shoulder physical examination skills for primary care providers caring for Active-Duty patients.

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Background: Musculoskeletal injuries are the leading cause of healthcare utilization in the military health system (MHS), costing the Department of Defense (DoD) approximately 434 million dollars annually and negatively impacting soldier readiness. Therefore, primary care providers must optimize physical assessment skills and diagnostic accuracy to institute an effective treatment plan for these types of injuries. In the current state, shoulder examination skills were identified as a top priority to improve. Improper diagnosis can lead to delays in care, lost productivity, increased costs, and negative healthcare outcomes.

Clinical Question: Is there an evidence-based training course that can improve primary care provider shoulder assessment skills?

Project Design: Training consisted of a simultaneous didactic portion and hands-on utilization with subject matter experts. The one-day intensive shoulder workshop effectiveness was evaluated using assessment competency surveys and graded Observed Structured Clinical Evaluations (OSCE), using a Likert scale pre and post-test tool.

Analysis of the Results: Analysis indicates that providers that took part in the shoulder assessment improvement workshop reported increased confidence and competency in their shoulder assessment skills after training. Objective analysis showed a significant increase in the pre-and post-OSCE scores. The combined mean score demonstrated an improvement of 21.3 comparing OSCE pre to post-test scores. Qualitative analysis showed an improvement in pre and post course surveys.

Organizational Impact for Practice: MSK injuries significantly impact soldiers' overall health and readiness. A short, standardized shoulder workshop can improve the confidence of the primary care provider's competency and hands-on skills as demonstrated by the improved scores of the OSCE evaluations. Proper diagnosis at the time of health care delivery aligns closely with the MHS Quadruple Aim of increased readiness, better health, better care, and all achieved at lower costs.

Abbreviated Version

Project Purpose: Find, implement, and evaluate an effective training program to improve the Shoulder physical assessment skills for primary care providers.

Impact: The training programs goal is to improve primary care providers confidence and hands-on skills with shoulder physical assessment

Introduction

The United States (U.S.) military is regarded as a rapidly deployable, agile, and lethal force. Currently, it is made up of approximately 1,335,848 active component Service Members (SMs) across all branches (Department of Defense (DoD), 2021). Maintaining and restoring the health of all SMs is imperative to promote a force that is ready to deploy at a moment's notice, as health conditions are the greatest limiting factors for operational readiness. The most detrimental conditions to readiness are those related to the musculoskeletal system. Musculoskeletal injuries (MSKIs) produce 2.2 million outpatient encounters annually (Grimm et al, 2019, p84), account for approximately 65% of the medically non-deployable forces and produce 8 million limited duty days in 2018 (Molloy et al, 2020, p1461). The most common sites of MSKIs within the military included the lower back, knees, and shoulders (Molloy et al, 2020, p1466). A recent article by Hathcock et al, (2022), reveals that shoulder injuries are the third most common complaint within the DoD (p.1240). Furthermore, shoulder injuries represent 8-24% of all MSKIs in the military, and SMs were 5-15 times more likely to sustain a shoulder injury than the civilian population (Leggit et al, 2021, p.1). Likewise, certain characteristics such as being male, or holding specific military occupational specialties (MOS), like a mechanic or an engineer, implies greater risk of sustaining shoulder injuries (Cameron & Owens, 2016 & Malloy et al, 2020, p.1466). In Fiscal Year 2014 (FY2014), the Military Health System (MHS) reported approximately 193,455 outpatient visits related to shoulder complaints alone, and at a cost of approximately \$65 million (Leggit et al, 2021, p.1). The study by Leggit et al, (2021) highlights the significance of shoulder injuries in relationship to operational readiness, and the financial burden placed upon the DoD. Despite the commonality of shoulder injuries within the DoD, SMs are often misdiagnosed by primary care providers resulting in wide-ranging treatment outcomes,

overuse of costly diagnostic imaging studies, persistent symptoms, and even premature termination from service (Hathcock et al, 2022, p.1240).

Project Problem Synthesis

PCPs are first line to assess and diagnose musculoskeletal complaints, and they are expected to develop an initial treatment plan including- prescribing appropriate therapies, making referrals, prescribing medications, and ordering imaging studies. Unfortunately, despite the prevalence of MSKIs, numerous PCPs report feeling a lack of confidence, skills, or knowledge to accurately assess musculoskeletal complaints. Primary care providers correlate their feelings to inadequate initial training (Bishop et al., 2013, p.451). Reinforcing this notion, Matheny et al. (2000), found that graduating family practice residents who received additional orthopedic services training reported greater confidence than residents who had not (p.945). The consensus of the literature review for this project demonstrated that PCP confidence and competency could improve with the implementation of additional training programs. Proper assessment and diagnosis allow for appropriate treatment plans to optimize SM recovery.

Relevance to Military Nursing

MSKIs are a significant and long-lasting financial burden to the DoD, and they collectively cost approximately \$434 million per year (Molloy et al, 2020, p.1463). Shoulder injuries accounted for approximately \$65 million in direct care costs, which averaged about \$336 per outpatient visit in FY2014 (Leggit et al, 2021, p.1). Several factors contributed to these costs, such as repeated outpatient visits, use of one or more radiological studies, and prescription medications.

According to Leggit et al (2021), in FY2014 76% of patients treated for shoulder injuries were seen four or fewer times for the same shoulder complaint, while 24% were seen more than four times (p.1). During the same investigation Leggit et al (2021), found that 75% of all shoulder injuries were sent for plain x-rays 81% of the time and magnetic resonance imaging (MRI) at 8%, and 74% of patients received more than one radiological study for the same complaint (Leggit et al, 2021, p.1). Lastly, Leggit et al (2021), found that of the patients included in this study, about 45% were prescribed a single medication, 21% had two medications, and 32% had three or more prescription medications related to their shoulder complaint, and at an average cost of \$14.91 per each prescription medication (p.1).

The most significant advantage to improving shoulder assessment skills of PCPs is the relevance to the MHS quadruple aim, and how it interacts with each of the four arms - better health, better care, lower costs, and increased force readiness. First, PCPs with accurate assessment skills influence the aims of improving health and improving health care of the forces, by being able to identify and diagnose the etiology of shoulder complaints in fewer visits. This allows PCPs to initiate appropriate treatment plans and relevant referrals in a timely manner. Second, improved assessment skills support the MHS quadruple aim of reduced costs by minimizing the use of costly radiologic studies, because practitioners have the skills and knowledge to arrive at the most likely diagnosis within the clinical setting. Thus, reserving the use of imaging studies for specific cases such as traumatic shoulder injuries, shoulder pain refractory to treatment, or shoulder pain of unusual presentation or circumstances. Quick and accurate diagnosis further reduces costs by limiting the duration of pain management, and likely fewer prescription medications for the same complaint. Lastly, the final aim of improved readiness is directly supported because accurate diagnosis and targeted therapies can be initiated

quicker, facilitating an expedient individual return to service which contributes to the overall goal of maintaining a relevant, ready, and lethal military force.

PICOT/Clinical Question

What educational program will help improve the shoulder physical assessment skills of primary care providers taking care of active duty SMs at Fort Hood, as compared to previous (usual) practice, to increase provider confidence in shoulder pain management?

Search Strategy/Results

To address the clinical inquiry, a clinical database search was conducted to uncover studies that investigated strategies to improve musculoskeletal exams of the shoulder and knee. Appendix A Table A1 notes the databases utilized to conduct the search and the timeframe limit for the studies. Table A2 notes the keywords that were included in the search strategy.

In total, 31 studies were imported from the keyword search. After the removal of duplicates and study screenings, nine studies remained. The results were screened by both authors for relevance, design, intervention, and setting. Included in the appendix is a diagram of the literature appraisal noted in Table A3. The inclusion and exclusion criteria that were utilized for the literature screening are noted in Table A4. (See appendix A for tables and PRIMSA diagram.)

After reviewing the literature, a range of evidenced-based solutions were considered for the feasibility of adoption and integration at Carl R. Darnall Army Medical Center (CRDAMC). The following bullets are summaries of the solutions that were considered for the clinical question.

Barker et al., 2020, conducted a two-day “SimLEARN” educational experience inspired by Battistone et al., 2016b “Mini-residency” curriculum. Barker et al. (2020), curriculum was adapted to fit the SimLEARN requirements of no more than two days. Thus, this version focused mainly on shoulder and knee assessments and included a one-station shoulder, observed structured clinical evaluation (OSCE) as the culminating event. The results were in line with the previous similar studies, indicating improved provider confidence through pre/post self-assessments, and objectively through an OSCE station checklist with a mean score of 83.2% (Barker, et al, 2020, p 45).

Battistone et al., 2017, performed a study on the validity of the OSCE checklists for shoulder and knee evaluation. The results indicated moderate inter-rater agreement for the knee OSCE at 87% ($k=0.61$) and near-perfect inter-rater agreement of the shoulder at 97% ($k=0.88$). Thus, the results of this study support the validity of the knee and shoulder OSCE checklists used in previous studies by Battistone et al, and their continued use in evaluating education effectiveness.

Battistone, et al., 2016a, conducted a three-day “Mini residency” program at 13 Veterans Administration facilities across the United States. The program consisted of three days of intensive knee and shoulder assessment skills education, anatomy and pathology review, and small group examination practice. This culminated in a two-station OSCE of the knee and shoulder to assess for objective measures of provider competence. The results of the “Mini residency” demonstrated subjective evidence of effectiveness through improved post-intervention self-assessments and objective improvement, with most participants scoring in the 81-100% range on the post-intervention OSCE checklists.

Battistone, et al., 2016b, conducted a five-day intensive “Musculoskeletal Education Week” aimed at education for the multidisciplinary team and medical professional trainees. This study encompassed a broader and more detailed MSK curriculum. The curriculum includes education on back pain, rheumatology, shoulder pain and assessment, osteoporosis, knee pain, and assessment, and various injection clinic experiences, and culminates in an observed standardized clinical examination of the shoulder and knee. The results of this study showed evidence that this educational model improved the participant’s confidence in the evaluation and management of common MSK conditions and their ability to perform and interpret shoulder and knee assessments.

Denizard-Thompson, et al., 2018, conducted a shoulder and knee workshop for primary care residents. The workshop was a half-day session that included didactic presentations focusing on history taking, physical exams, and procedural skills. The procedural skills included knee as well as subacromial bursa injections. The workshop was evaluated using pre- and post-course competency assessments. Residents who participated in the training uniformly agreed that the experience improved their MSK knowledge as well as the majority stated they felt much-increased confidence performing joint injections.

Siddharthan, et al., 2017, implemented an MSK-based educational workshop for residents about common neck and back complaints. The workshop included interactive lectures and a two-station OSCE evaluation immediately following the educational experience, and then participants were evaluated again six months later. The standardized patients for the OSCE stations were portrayed by undergraduate medical students. The results of this study provided evidence that the residents who participated in the workshop and OSCE experience performed much better when compared to residents who had not completed the workshop both immediately

and at six months later, as demonstrated by OSCE performance scores. As a secondary benefit, the undergraduate medical students who participated as standardized patients also performed better when compared to their peers who had not participated as standardized patients on the same clinical skills.

Zabel, et al., 2019, conducted a study of 236 third-year medical students from Goethe University in Frankfurt, Germany, to compare the effectiveness of three educational modalities. The students were randomized into three modalities: the common educational approach, the teaching associate approach, and the patient experience approach. The common educational approach included an instructor-led demonstration of the skill and then students examining one another under supervision. The teaching associate approach involved the students first practicing on a teaching associate, receiving feedback, and then practicing the examination on peers with instructor supervision and guidance. The final approach was the patient experience method. Each medical student in this group is first examined by an instructor (the patient experience) and then given the opportunity to practice the examination on each other with instructor guidance and feedback. After completion of the training, all students were evaluated on their shoulder and knee assessment skills using an OSCE checklist. The OSCE evaluations occurred at two different points in time, once immediately after the training and a second evaluation five weeks later. The results showed that students who were in the teaching associate and patient experience groups outperformed those from the common approach group on both the shoulder and knee assessments at both measurement points.

Hose, et al., 2017, Conducted a 4-week musculoskeletal clinic rotation with at least five shoulder patients assigned. The eighty-nine University of California, San Diego medical students and Internal Medicine residents volunteered to participate in the study. Baseline testing was

conducted to determine learners' knowledge prior to clinical rotation. These assessments consisted of a written shoulder pathology exam, a standardized patient shoulder examination that was videotaped, and a survey of the trainees' confidence level in shoulder exams and management. The same tests were conducted at the completion of the 4-week clinical rotation. All three assessment domains demonstrated marked improvement. Videotaped shoulder scores improved by 115%. Written exam scores improved by 27.5%. The mean attitude scores regarding confidence in conducting shoulder exams improved from 2.57 to 5.29 (On a 5-point Likert scale).

Lewis, J., 2016, piloted a masterclass with a focus on rotator cuff-related shoulder pain (RCRSP). The masterclass discussed: function, pain, etiology, use of imaging, surgery, assessment, and management. The article reveals that common orthopedic tests are better at provoking symptoms rather than identifying and diagnosing rotator cuff pathology. Lewis, J., 2016, discusses the use of exercise treatment that modifies (alleviates) symptoms to improve shoulder assessments. An additional benefit to this method is the earlier initiation of rehabilitation. The treatment assessment tool used was the Shoulder Symptom Modification Procedure (SSMP). During early SSMP stages, if an assessment procedure reduces symptoms, that procedure is utilized as a part of the treatment plan. If no procedures reduce symptoms, then additional shoulder and neck assessments are performed, followed by a structured exercise regimen.

Solution Synthesis

Among the reviewed articles, the duration of training interventions ranged from a single day to four weeks, with a resultant mean duration of 2-5 days. The training curriculum often

consisted of didactic classes, hands-on experiences in small groups, and clinical rotations. Provider competency was measured with pre-and post-course evaluations in the form of self-assessment surveys, musculoskeletal knowledge tests, and graded OSCEs.

Initially, CRDAMC clinic leaders were consulted to hedge the viability of a two-day training workshop. Our workshop initially focused on improving the provider's knee and shoulder examination skills. However, during deliberations, consulting leadership raised concerns about removing PCPs from patient care for multiple days and negatively impacting patient access to care over that time frame. In consideration of their concern, we determined that a one-day program was a more feasible duration that still satisfied the overall goal of our project. A one-day training program is supported by the reviewed literature when the education program is limited to a single joint and targeted at improving assessment skills only. The 2–5-day training interventions reviewed included instruction on multiple joints, and advanced procedures such as joint injections and manipulation. Since improving PCP musculoskeletal assessment skills is the sole aim of our project, the training intervention evolved into a one-day, shoulder assessment workshop. Our event focused on teaching a systematic approach to assessment of the shoulder joint, thus maintaining the original direction of the project, and with respect to concerns from leadership of a multiple day event.

Focus Areas

The focus areas for this project were developed by observing commonalities within the literature. Two main themes emerged throughout the literature review, first the employment of intensive in-person workshops to increase provider confidence and competence in joint exams (shoulder and knee). Second, focusing on only a single joint allowed for a reduction in the

training timeline. Previous pilot programs employed 2–5-day intensive shoulder assessment workshops to enhance provider knowledge, confidence, and accuracy in identifying shoulder pathology. The workshops were commonly initiated with participants completing a self-assessment survey of knowledge and confidence in shoulder assessment skills measured on a 5-point Likert scale. Next, PCPs participated in a graded pre-course OSCE of the shoulder. These assessments establish baseline subjective and objective data points. The educational portion of the workshops were conducted over 2-5 days, utilizing subject matter experts (SMEs) to provide short lectures, live demonstrations, and guided hands-on practice with expert feedback. The workshops culminated with a repeat self-assessment survey and graded OSCE experience to establish comparative data points for analysis of the educational intervention.

The secondary focus area was keeping the duration of the workshop to a single day to maximize the ability of primary care providers to participate; due to elimination of access to care issues by removing providers from the clinic for a shorter duration of time.

Business Case Analysis

In order to analyze the potential benefits and gain support from institution leadership, a business case analysis (BCA) was conducted. Some criteria and data from the analysis were not used in the final project. For example, a potential metric that was used for evaluating the cost saving benefit included the reduction of ordered radiographic imaging pre- and post-course. The costs for the imaging were gleaned from open sources found online, such as a radiology imaging practice (Northwest Radiology, 2021) and a nationwide hospital chain (Nationwide Children's Hospital, 2021). Due to the time constraints in the project timeline, it was not feasible to go through the approval process necessary from the Defense Health Agency (DHA) that would be

required to perform the electronic medical record searches needed to obtain pre- and post-course ordered imaging. Thus, the information that is presented is purely estimations based on possible projections and not real-world data.

The business case analysis is a crucial step in implementing the project within the organization. This step analyzes financial impact negatively or positively, within CRDAMC and serves as a determining factor of overall leadership support. Fort Hood, TX, has an approximate population of 37,000 active-duty personnel, and an injury rate of 1,801 newly diagnosed MSK injuries per 1000 person-year (Health of the Force Report, 2020). Shoulder injuries represent approximately 8% of newly acquired injuries evaluated by CRDAMC annually. Financial estimates for this project were developed utilizing Northwest Radiology imaging costs guidelines, and the assumption that all newly acquired shoulder injuries are imaged using magnetic resonance imaging (MRI), computed tomography (CT), and x-ray. The costs for each imaging modality are MRI \$2000, CT \$1200 (Northwest Radiology, 2021), and x-ray \$190 (Nationwide Children's Hospital, 2021). The estimated annual expenditure is \$488,160 to image all new shoulder injuries utilizing all three modalities. Based on the literature review, the evidence does not support utilizing imaging during the early phases of shoulder pathology management due to the low correlation between imaging findings, physical exam findings, and patient complaints (Lewis, 2016). Assuming the shoulder injury rate remains at 8% of all new injuries, proposing a 25% reduction of all imaging studies over one year is estimated to save the organization approximately \$122,040 in imaging studies alone.

Initial costs to implement the educational intervention are minimal considering the usage of internal personnel such as PT staff and facilities. The largest expected expenditure is estimated at around \$2000, accounting for facility usage. Other expected expenditures are

estimated at around \$1500 and are allocated to advertising materials, teaching materials, writing utensils, and posters. Overall, the net savings for the organization, at a 25% reduction in shoulder imaging, and accounting for implementation costs, is estimated to be around \$118,540 over the first year. A business case analysis worksheet document is included in the appendix.

Organizing Framework

The Iowa Model of Evidence-Based Practice was selected to implement the PCP musculoskeletal shoulder assessment improvement project for Ft. Hood. This model was chosen based on four main factors. First, the model explicitly starts by ensuring that the topic is a priority for the organization. The success of a project is dependent on support from the organization's key leadership (Titler et al., 2001, p. 503). This was accomplished by selecting a problem that was already highlighted as a priority by leadership in the CRDAMC GME department and with consideration to the prevalence of shoulder injuries within the military. Second, the Iowa Model lays out the role of a pilot program by placing the proposed changes into practice on a small scale. Initial small-scale implementation has numerous benefits; such as lower initial investment of resources, easier buy-in from the organization, faster implementation of proposals, and ease of data collection and analysis. Third, the pilot data collected provides evidence to key leaders of the effectiveness of the program, and justification for or against adoption of the program within the organization. Lastly, the Iowa Model has built-in trigger mechanisms to reevaluate practice in recognition that practice is ever evolving and should strive to incorporate the newest evidence that will improve patient care.

Project Design

The project design is a quality improvement project (QIP) and thus is not deemed to be research, as it was not intended to uncover new data to solve a clinical problem. Our project applies existing knowledge from our literature review to improve the performance of our participants. As a QIP project, the results are only applicable to those that participated at CRDAMC. The population of interest for our project was primary care providers who care for active-duty Service Members at Fort Hood. Under the CRDAMC organizational umbrella, Fort Hood and its surrounding area have seven active-duty clinics and four beneficiary medical homes.

General Approach

Our quality improvement project was a pre-/post-education intervention that utilized a one-day training course to improve shoulder assessment skills of PCPs caring for active duty SMs. Each training day started by an introduction to the program, and a detailed review of the agenda. Each participant was then asked to complete a pre-intervention shoulder assessment self-confidence survey. Next, our team videotaped each participant individually performing a basic shoulder examination on a standardized patient. These recorded exams were scored at a later time, against the program OSCE checklist in order to establish baseline data. After completing the recorded OSCEs, the participants reconvened in the classroom for a course of short lectures including: an anatomy review, guidelines for imaging, treatment and management recommendations, and a demonstration of a systematic shoulder assessment per the OSCE checklist. The didactic portion of the program was broken up into multiple small group hands-on training sessions, to allow participants to practice what they learned with on the spot subject

matter expert guidance. Then participants challenged their new skills by performing three ungraded shoulder examinations on standardized patients with pathology in small groups. Afterwards, participants were given additional time to practice the shoulder examination with subject matter experts, and participate in small group discussions. We allowed this portion of the course to be flexible in duration, and was directed entirely by participant comfort levels with the OSCE checklist. The culminating events of the program was a graded post-intervention OSCE, post-intervention shoulder assessment confidence survey, and end of course evaluation. Participants were again individually videotaped performing the shoulder examination on the same standardized patient and using the same checklist as the pre-intervention OSCE. These videotapes were then reviewed and scored against the OSCE checklist for comparative data. After completion of the three training dates, all the data from the pre-/post-intervention OSCE and self-assessments were compiled and analyzed to determine the significance of the training program. Lastly, the project findings were disseminated throughout the organization utilizing posters, presentations, and a detailed paper.

Setting and Population

The QIP project took place at the Monroe Clinic at Fort Hood, TX, over the course of three separate training days. The training was conducted in a classroom-like setting and conference space. Each training day averaged around six to eight hours in length, depending on the number of participants in the class and the amount of time spent in small group discussions. All the project participants were members of the target population of primary care providers around Fort Hood. The total number of participants over the three days was 20 primary care providers. Ten of the providers were Physician Assistants, three were Physician Assistant

Students, two were Physicians, and five were Nurse Practitioners. The first and second workshops both had eight participants, and the final workshop included four participants.

Procedural Steps

The project design was divided into four phases extending over 16 months. This approach allowed the team to establish maximum leadership support, identify and recruit SMEs, develop a robust and relevant curriculum, enroll participants, and allow for critical analysis, evaluation, and dissemination of the educational intervention findings. The general time frame was initiated in August of 2022 and culminated in May of 2023.

Phase one (Approvals and Project Planning Phase) covered August through December of 2022. Four key tasks were addressed during this phase. First, submission and approval of the project to the Uniformed Services University of the Health Sciences (USUHS). Second, CRDAMC internal review board (IRB) submission and approval. Third, we conducted key stakeholder and leadership engagement meetings from relevant departments and clinics. Fourth, we recruited subject matter experts in shoulder physical exams to act as trainers and recruited primary care providers to participate as trainees. Beginning in December of 2022 our team started advertising the training opportunity and enrollment process by attending in-person leadership meetings and sending weekly emails to clinic leadership.

Phase two (Project Implementation) covered January through February of 2023 and consisted of three key tasks. First, we administered the pre-intervention PCP self-assessments and OSCEs to establish baseline data points. Second, we conducted a one-day intensive workshop. Third, we administered the post-intervention PCP self-assessment and OSCE for comparative data points.

Phase three (Data Analysis Phase) began in February through March of 2023. This phase consisted of two key tasks. First, we compiled and examined data from the provider pre-/post-intervention surveys and OSCEs to determine statistical and clinical significance, and appropriateness of adopting the program within the organization. Second, we analyzed post-training after action review comments and planned for implementation of relevant suggestions for future workshops.

Phase four (Dissemination Phase) covered March 2023 through May 2023. This phase was modeled from the “Three P’s approach.” This method included a paper detailing the project and findings, posters with key highlights published within the organization, and a formal presentation to project stakeholders (Milner, 2016, p.298). In order to promote maximum dissemination, our project posters were displayed in three key locations: one poster was displayed during CRDAMC research day, a second poster was displayed during the Uniformed Services University of Health Sciences (USUHS) research week, and one poster was displayed outside of the organization at the TriServices Nursing Research Program (TSNRP). Two formal presentations were given; the first presentation was conducted on April 7, 2023, and given to USUHS faculty. The second presentation was for dissemination to CRDAMC leadership and was conducted on April 27, 2023. As a final part of the dissemination plan a formal paper was written outlining the project in detail and made available to USUHS graduate archives.

Data Analysis Plan

The project was designed to improve the shoulder exam skills of primary care providers. To assess the effectiveness of the workshop, we collected both qualitative and quantitative measurements. The qualitative measurements consisted of pre-/post-course self-assessment

surveys by the provider participants. The surveys consisted of 5-point Likert scale questions, see Appendix E. To analyze the data from the Likert scale questionnaire, we utilized the Wilcoxon signed-rank test. This test was used because data gained from a Likert scale is ordinal data, and the Wilcoxon is the non-parametric equivalent of the Paired t-test. The quantitative measurement was conducted utilizing videotaped shoulder OSCEs conducted pre-/post-intervention. The taped exams were then graded using an exam checklist that utilized a 3-point scale per assessment area, see Appendix D. OSCE exams were dual graded to ensure the inter-rater reliability of the graders, using Cronbach's alpha to measure the internal consistency or reliability of the relationship between the two grader's scores. The pre- and post-scores per student were evaluated using the paired t-test to test the difference between the two related groups.

Potential Barriers

An identified major barrier was procuring ample recruitment of participants for the purposes of providing an adequate project sample size. Providers' time is invaluable due to the importance of maintaining patient access to care. The mitigation strategy utilized was meeting with clinic and department chiefs to persuade these key stakeholders of the value of this training. Leveraging key administrator support, providers were made available using administrative time and alternative work schedules to participate in the training program.

The second major barrier to successful implementation of the QIP was the original multi-day curriculum and removing providers from clinics for the entire duration. To alleviate these concerns, the team adapted the original curriculum to focus on a single joint versus two joints. A focused single-day training event maintained the training quality as outlined in the literature review and goals of the project and created less access to care issues.

The third barrier was obtaining resources such as subject matter experts (SMEs) to assist in teaching and a suitable venue in which to conduct the training. Physical Therapists possess a wealth of knowledge in shoulder assessment skills and were well-postured to act as SMEs able to provide didactic education and supervised clinical experiences for the intervention. The CRDAMC Department of Rehabilitative Services was contacted and educated on the desired shoulder assessment training program that was to be implemented. Utilizing the desire for an education project for the Physical Therapy Residency program, we were able to get buy-in from the Department leadership. The Physical Therapy Department Interns, with supervision by their residency director, acted as SMEs for the training workshop. Additionally, after discussion with multiple CRDAMC clinic leaders, a clinic within the CRDAMC footprint had an unused clinic space that was formerly a Physical Therapy gym. The space was granted for use during all three of the shoulder assessment improvement workshops, as the space could be utilized without affecting ongoing clinic operations.

The potential barriers to collecting the provider confidence data were minimal. Only those primary care providers that participated in the training were subject to completing the questionnaire. The questionnaire was designed with no more than five questions to maximize the completion of the questionnaire by the participants. Barriers to implementation would have been a provider that was unwilling to return a post-training survey, thus making it impossible to perform pre-/post-intervention comparison analysis. This risk was reduced by outlining the expectations of pre-/post-survey completion both during the recruitment process and on the day of the training.

Dissemination Plan

Evidence-Based Practice projects improve care when results are shared throughout the organization in a widespread fashion. To facilitate the widespread distribution of our results, we utilized the traditional three P's approach (Milner, 2016, p. 298). Our team analyzed the findings of our project and explained the findings in a paper to be distributed to leadership and staff within the organization. Second, we created and distributed posters that highlighted the key points of the training, our findings, and how providers can participate in the future. Three posters were distributed: TriService Nursing Research Program (TSNRP) conference, the CRDAMC research day, and at the Uniformed Services University of the Health Sciences (USUHS) research week. TSNRP took place on April 4-6, 2023 in San Antonio, TX. CRDAMC research day was May 18, 2023. USUHS research week took place on May 16-19, 2023 in Bethesda, MD. Lastly, we presented our findings to USUHS faculty on April 7, 2023 and again on April 27, 2023 to CRDAMC key leaders.

HIPAA Concerns/Ethical Considerations

There were no HIPAA-related concerns related to the shoulder assessment improvement workshop. No patient information was utilized during the project. Standard patient information, created by the project authors Battistone and Barker, was used during the small group portion of the training, and is not related to any real-world patients (Battistone et al., 2017). All provider participant demographic data was anonymized after data analysis, as the only information to be publicized in the project was the participant's professional status, professional specialty, and years of medical practice. Information that is de-identified can be used without restriction per HHS guidelines related to protected health information (U.S. Department of Health & Human

Services [HHS], 2008). Data collected during the training evaluation, such as individual participant results, including the pre-/post-intervention surveys and the pre-/post-intervention OSCE scores, was not linked to individual demographic information within the project to maintain the anonymity of participant results.

Project Results

Over the course of three training sessions between January and February 2023, twenty providers participated in the shoulder assessment improvement workshops. The mean number of years of clinical experience was 5.7 years, with 0.5 years as the least and 25 years as the most. Of the providers trained, 13 were Physician Assistants (PA), 5 were Family Nurse Practitioners (FNP), and 2 were Physicians (MD/DO). No significant difference was noted in the providers' pre-course versus post-course assessments when comparing certification types. All twenty providers conducted pre-course self-assessment surveys, and nineteen completed the post-course self-assessment survey. Pre-course survey was conducted using a 5-point Likert scale, when asked to grade confidence in the ability to perform a shoulder exam (1 point for lowest confidence and 5 points for highest confidence), the pre-course total for all participants was 62 points with a post-training score of 81 points out of 100 possible. The pre-course mean score was 3.1, and the post-course mean score was 4.26 for all 20 participants.

All twenty providers conducted pre-/post-course graded OSCEs. Each OSCE was videotaped and scored by two separate graders. The quantitative results from the pre-/post course graded OSCE's showed significant improvement with both graders as noted in the table in Appendix B Table . The mean score improvement pre-/post-course for grader 1 was 22.2 and for grader 2 was 19.55. Data was ordinal and parametric, thus standard deviation could be applied.

Pre course standard deviation between graders was only 0.03 and post course standard deviation between grader was only 0.087; thus showing very little difference between graders.

When combining the individual graders, the pre-course mean score was 17.3 out of 42, and the post-course mean score was 38.2 out of 42. A statistically significant t stat of 19.29 was noted, and a 21.3 mean score improvement was noted between pre-course and post-course OSCE assessments. No significant differences were noted between the different providers' credentials pre-/post-OSCE evaluations. The OSCE combined grader results noted above can be seen in Appendix B Table B7.

Analysis of the Results

Does participation in the one-day shoulder assessment workshop significantly improve the shoulder assessment skills of primary care providers caring for active-duty service members? The qualitative improvement project was evaluated to see if there would be significant difference between the mean pre-course and post-course shoulder assessment scores for primary care providers that took part in the training workshops. A paired t test was used to analyze the results of the pre-/post-OSCE grading as data. The paired t test was chosen as the results were ordinal and parametric data from the same (or paired) subjects pre-/post-intervention. The results of the paired samples test showed that there was a significant improvement in shoulder assessment skills between pre- and post-course OSCE scores for both Rater 1 ($t(19) = -15.624, p < .001$) and Rater 2 ($t(19) = -10.648, p < .001$). The mean pre-course OSCE scores for both Rater 1 and Rater 2 were substantially lower than the mean post-course scores, indicating that the training intervention positively impacted shoulder assessment skills. To evaluate the inter-rater reliability, Cohen's kappa test was run on the two OSCE rater scores. The value of Kappa was 0.615, For

the pre-intervention checklist, which indicated a substantial level of agreement between the two raters. The asymptotic standard error of Kappa is 0.036, and the approximate t-value was 5.282, which measures the size of the difference relative to the variation in our sample data. Suggesting that the observed value of Kappa was statistically significant ($p < .001$) and unlikely to be due to chance. In the post-intervention OSCE checklist, the value of Kappa was 0.701, which indicates a substantial level of agreement between the two raters. The asymptotic standard error of Kappa is 0.036, and the approximate t-value was 3.313, suggesting that the observed value of Kappa is statistically significant ($p < .001$) and unlikely to be due to chance. In summary, these results suggest that there is a high level of agreement between the two raters for the measure of interest, and the observed level of agreement is statistically significant. Therefore, there is proof of reliability between the two raters. The full table of data for inter-rater reliability for pre-course is noted in Appendix B Table B4.

The pre- and post-course survey data was evaluated using the Wilcoxon signed-rank test. The Wilcoxon test was used because data gained from the Likert scale survey conducted was non-parametric ordinal data, and the Wilcoxon is the non-parametric equivalent of the Paired t-test. The full results are noted in the table in Appendix B Table B8. The Alpha selected for our QI project was the standard 0.05 and thus as can be seen in the table that the W test statistic is below the threshold for results having occurred due to chance. The results in the table are separated by the different training sessions. In all sessions the results were deemed significant and not likely to be a result of chance. Combined sessions data was also used as the low participation rate in Group 3 made statistical significance impossible to evaluate on its own.

Proposed Organizational Impact and Implications for Practice

Our project was selected by key leadership from CRDAMC as an area that needed improvement within primary care with direct intention of improving care within the CRDAMC organization. Results revealed statistically significant improvement in shoulder assessment skills of the participants. The participants also reported a significant increase in confidence of the shoulder assessment, and overall satisfaction of the training program. With that, there are three main organizational impacts of the project. First, with improved assessment skills, providers are less likely to inappropriately order imaging studies. As previously discussed, imaging studies are costly and often do not offer additional information in correlation to shoulder pathology. A reduction in unnecessary imaging studies is a cost savings for the organization. Second, improved assessment skills lead to quicker and more accurate diagnosis of shoulder complaints, and swift initiation of a treatment and management plan. With expedient and accurate diagnosis and treatments, SMs can heal quicker, experience less limited or lost duty days, and have a greater chance of returning to duty. These impacts also support the Defense Health Agency's quadruple aim of improved readiness, better health, better care, and lower costs.

Future Direction for Research and Practice

Overall the project was well received by all participants. Most participants stated that the short lectures, interjected with SME led small-group experiences helped to solidify the knowledge and skills being taught. They also mentioned that the systematic and structured approach of the shoulder exam, and that performing it in the same order every time improved the provider's ability to recall and understand the components of the exam. Additionally, the structure of the exam enhanced their ability to correlate exam findings to the etiology of shoulder

complaints. A secondary sustain to the program was a three-pronged symbiotic relationship that was created between the CRDAMC physical therapy department, the GME team, and the Veteran's Administration of Salt Lake City, UT. The CRDAMC physical therapy department interns served as SMEs and primary educators throughout the pilot project. Our project was mutually beneficial to fulfill the PT interns' and the GME team's graduation requirements. This also led to discussions of continuing the partnership, and implementing this program into future PT intern graduation requirements. A partnership was also created with the original authors Dr. Michael Battistone and PA Andrea Barker from the Salt Lake City, UT Veterans Administration (VA) and CRDAMC. This partnership facilitated a bi-directional flow of information between the two organizations in context to setting up the program, the sharing of educational materials/products, and lessons learned.

While there is much to praise about the pilot program, there were several limitations to our project. The first limitation was, participants were tested on the same day as the didactic portions and small group events, thus the data only represents near-term effectiveness of the training. However, it would be beneficial to retest participants six to eight months post-training to evaluate for skill erosion and long term benefits to the organization. Second, our project did not investigate the current use of imaging studies, number of outpatient visits for the same complaint, nor the number of prescriptions per patient within the CDRAMC footprint. Future projects may examine the aforementioned metrics, and relate those findings to the potential and actual cost benefit within the organization. Lastly, our project did not investigate the pre-/post-intervention influence of the training program on, the number of lost and/or limited duty days, nor the number of shoulder related premature discharges from military service. These are important factors to consider in context to the overarching MHS goal of increasing total force

readiness (MHS, 2021). The participants noted the one-day workshop improved their confidence and physical examination skills. Thus, many of them inquired about future training workshops and suggested including additional joints such as the hip and incorporating joint injection training.

Conclusion

Due to the inherently physically demanding nature of the military, it is reasonable to suspect that shoulder injuries will continue to be a significant issue both financially and operationally within the military. As of 2019, Hathcock et al (2022), found that 63% of all upper extremity injuries originated from the shoulder joint, emphasizing the importance of competent and precise assessment skills. Improving PCP exam skills ultimately leads to accurate and expedient diagnosis, and quicker initiation of definitive treatment. Additionally, improved exam skills may reduce costs associated with unnecessary diagnostic imaging, numerous outpatient encounters, and prescriptions. Lastly, in context to the benefits, these factors collectively support individual and total force readiness by promoting a SM's recovery and return to duty. With that, our project goal of improving shoulder assessment skills of the PCP's fully supports the DHA Quadruple Aim: of improved readiness, better health, better care, and at a lower cost (DHA, 2021). The results of our program mirrored the evidence of our literature review. Similarly, we found that a one-day, interactive, evidenced-based program improved the participants' physical examination skills of the shoulder. In respect to the success of the pilot project and the potential impact to the DHA Quadruple Aim, the organization should consider adopting the training program for continued use and expanding the program to include additional joints and advanced skills.

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Appendix A

Search Strategy

Table A1

Included online databases.

Table 1. Included online databases.	
PubMed (2006 to present) EMBASE (2006 to Present)	*Note all searches were limited to the last 15 years.

Table A2

Search Terms and Strategy

Table 2. Search Terms and Strategy		
Concept 1 AND Medical education methods	Concept 2 AND audience	Concept 3 Musculoskeletal
Competency Simulation Computer Assisted Learning Teaching Instruction	Students Providers Primary Care	Musculoskeletal examination Musculoskeletal assessment Joint examination Joint assessment Shoulder exam Knee exam Shoulder assessment Knee Assessment
*Note all searches were limited to the last 15 years and limited to articles in the English language.		

Table A3

PRISMA Diagram

Table 3. PRISMA
31 references imported for screening as 31 studies. 14 duplicates removed. 17 studies screened against title and abstract. 0 studies excluded. 17 studies assessed for full-text eligibility. 8 studies excluded. 4 Irrelevant 2 Wrong study design

1 Wrong intervention
 1 Wrong setting
 0 studies awaiting classification / ongoing
 9 studies included.

Table A4***Inclusion and Exclusion criteria***

Table 4. Inclusion and Exclusion criteria	
Inclusion Criteria	Exclusion Criteria
Population: Medical students Residents Physicians Intervention: Lectures Workshops small group learning sessions SP teachers Patient educators Peer teachers Structured clinical interviews Teaching OSCEs Simulations Videos Comparator: MSK Physical assessment teaching methods noted above Outcome: Confidence level of provider/student Observed assessment scores. written exam score	Population: Nurses Physiotherapists Other allied professionals Intervention: Shadowing/mentoring Clinical experience Practice audits Outcome: Procedural skills outcomes Satisfaction of teaching method

Appendix B
Statistical Analysis

Table B1

Pre and Post Course assessment of provider confidence

	1	2	3	4	5	Total	
Totals for all training dates							
Pre Course Assessment							
PreCourse Assessment							
With regards to shoulder pain, how confident are you in your ability to...							Mean Score (Pre-course Survey)
Question #4 - Perform a thorough physical examination of the shoulder? (Number of participants making selection)		3	12	5			3.1
Points per selection		6	36	20		62	
Question							
Post Course Assessment							
With regards to shoulder pain, how confident are you in your ability to...							Mean Score (Pre-course Survey)
Question #2 - Perform a thorough physical examination of the shoulder? (Number of participants making selection)			2	10	7		4.263157895
Points per selection			6	40	35	81	

Table B2*Paired Samples Statistics - OSCE scoring*

		Paired Samples Statistics			
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-course Scoring Rater 1	15.95	20	6.597	1.475
	Post-course Scoring Rater 1	38.15	20	3.760	.841
Pair 2	Pre-course Scoring Rater 2	18.65	20	6.627	1.482
	Post-course Scoring Rater 2	38.20	20	3.847	.860

Table B3*Paired Samples Correlations - OSCE scoring*

		Paired Samples Correlations		
		N	Correlation	Sig.
Pair 1	Pre-course Scoring Rater 1 & Post-course Scoring Rater 1	20	.348	.132
Pair 2	Pre-course Scoring Rater 2 & Post-course Scoring Rater 2	20	-.171	.472

Table B4*Interrater reliability rating for Pre-course OSCE scoring*

		Symmetric Measures			
		Value	Asymptotic Standard Error ^a	Approximate T ^b	Approximate Significance
Measure of Agreement	Kappa	.615	.036	5.282	.000
N of Valid Cases		21			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Table B5*Interrater reliability rating for Post-course OSCE scoring*

		Symmetric Measures			
		Value	Asymptotic Standard Error ^a	Approximate T ^b	Approximate Significance
Measure of Agreement	Kappa	.701	.036	3.313	.001
N of Valid Cases		21			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Table B6*Paired Samples Differences - OSCE scoring*

		Paired Samples Test							
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Paired 1	Pre-course Scoring Rater 1 - Post-course Scoring Rater 1	-22.200	6.354	1.421	-25.174	-19.226	-15.624	19	.000
Paired 2	Pre-course Scoring Rater 2 - Post-course Scoring Rater 2	-19.550	8.211	1.836	-23.393	-15.707	-10.648	19	.000

Table B7*Combined grader scoring for provider videotaped OSCEs*

Provider videotaped OSCE scoring		
	<i>Combined Pre</i>	<i>Combined Post</i>
Mean	17.3	38.175
Variance	44.47179487	14.09679487
Observations	40	40
Pearson Correlation	0.2344113665	
Hypothesized Mean Difference	0	
df	39	
t Stat	-19.29273533	
P(T<=t) two-tail	0	
t Critical two-tail	2.02269092	
		* Max score = 42

Table B8*Pre and Post survey provider significance of differences*

Pre and Post survey provider confidence		
Group 1 (n=8)	W test statistic = 0	Number of non-tied pairs (n) = 8
Group 2 (n=8)	W test statistic = 0	Number of non-tied pairs (n) = 8
Group 3 (n=4)	W test statistic = 0	Number of non-tied pairs (n) = 2
Combined data (n=20)	W test statistic = 0	Number of non-tied pairs (n) = 18

n	Alpha value				
	0.005	0.01	0.025	0.05	0.10
5	-	-	-	-	0
6	-	-	-	0	2
7	-	-	0	2	3
8	-	0	2	3	5
9	0	1	3	5	8
10	1	3	5	8	10
11	3	5	8	10	13
12	5	7	10	13	17
13	7	9	13	17	21
14	9	12	17	21	25
15	12	15	20	25	30
16	15	19	25	29	35
17	19	23	29	34	41
18	23	27	34	40	47
19	27	32	39	46	53
20	32	37	45	52	60
21	37	42	51	58	67
22	42	48	57	65	75
23	48	54	64	73	83
24	54	61	72	81	91
25	60	68	79	89	100
26	67	75	87	98	110
27	74	83	96	107	119
28	82	91	105	116	130
29	90	100	114	126	140
30	98	109	124	137	151

Appendix C

Business Case Analysis

BUSINESS CASE with VALUE BASED CARE ASSESSMENT

Proposed Title for Project/Initiative/Opportunity to Improve *Proposed Title*

Improving shoulder and knee musculoskeletal physical exam competency of primary care providers

Opportunity Statement (*Description of proposed project/initiative/opportunity to improve*) *Opportunity statement*

MSK injuries are very common in the military patient population. Providers with improved musculoskeletal physical exam skills will allow for faster diagnosis and treatment improving physical readiness of their patients.

Business Opportunity/Objectives (*Prioritize listing – macro and micro-objectives*) *Business Opportunity*

1. Improved Service Member readiness
2. Decrease time from initial assessment to diagnosis and treatment, by improving accuracy of assessment skills
3. Decreased operational costs - reduction of expensive imaging modalities, and reduction of referrals to civilian medical facilities
4. Improve provider/patient relationship and satisfaction

Potential Impact of the Initiative/Project (*Identify outcome metrics & benchmarks/and how objectives align with Quadruple Aim, Value Based Care, and HRO goals*) *Potential Impact*

1. Improved confidence level of provider/student in performing shoulder and knee physical exams.
2. Improved scores for primary care providers on observed graded physical assessments.
3. Reduction in use of radiological imaging to diagnose shoulder and knee complaints, reducing healthcare costs.
4. Percentage of shoulder and knee injury patients referred to physical therapy.

Alternatives (courses of action) chosen for Analysis *Alternatives*

1. 4-week musculoskeletal rotation in an ortho clinic. Evaluate baseline and post clinic time written exams, videotaped standard patient exams and provider confidence surveys. EBP article (Hose, et al., 2017)

2. Battistone, et al., 2016b, conducted a three-day “Mini-residency” program

3. “*Status Quo*”: Primary care providers at Fort Hood do not receive any additional focused training on shoulder and knee injuries. Assume current level of training is sufficient and do not attempt improve their skills or rely on them improving on their own time.

Analysis of Alternatives

Alternative 1: 4-week musculoskeletal rotation in an ortho clinic

Pros

Ease of implementation of training program as ortho clinics provide ease of access to SME in MSK complaints.

With a long time, frame and additional MSK experiences there is potential for primary care providers to improve physical exam skills for MSK complaints beyond just the shoulder and knee.

Time spent with orthopedic providers may improve long term collaboration between ortho and primary care.

Cons

Long time commitment for providers to be away from their primary care duties.

Limited ability to grade effectiveness of training to other areas as written exam and graded assessments focus on shoulder and knee exams.

Requires buy-in and large training time investment for ortho to allow primary care providers to train in their clinical area.

Alternative 2: 3 day “mini residency” program for shoulder and knee assessment

Pros

Shorter time commitment of 3 days to train primary care providers in shoulder/knee assessment skills

Self-sustainable program through use of “train the trainer.”

Cons

Providers must be out of the clinic for the 3-day “mini residency”

High faculty to learner ratio required

Can only train a limited number of providers at one time due to the amount of time required for the “mini-residency.”

Expandable curriculum that could include supervised joint injection experiences as well.	Initial investment may be costly Battistone et al (2016), estimates \$30,000 per facility for initial investment
Improved assessment skills validated through Observed Structured Clinical Examinations (OSCE)	
Cost savings in the form of fewer expensive imaging modalities, and referrals to off-post medical facilities, and faster diagnosis/treatment	

Alternative 3:	<i>"Status Quo": No focused musculoskeletal assessment training</i>
Pros	Cons
No loss in patient access to care as providers would remain in clinic	No costs savings for the facility
No further investment necessary	Continuation of unnecessary imaging and treatment ordered
	No reduction in off-post medical treatment facility referrals
	Delay in diagnosis and treatment due to waiting for referrals
	No growth in provider expertise/knowledge of musculoskeletal conditions

Assumptions
<ul style="list-style-type: none"> - Musculoskeletal injuries (MSKI) affect 800,000 service members annually (Grimm, et al 2019). - Account for 53-76% of non-deployable service members (Grimm, et al 2019). - Non-combat related MSKI are 6 times more frequent than combat-related, they affect over half of all non-deployed military personnel, and account for 90% of all injuries in deployed settings (Grimm et al, 2019). - MSKI accounts for 2 million outpatient medical encounters annually, and more in-patient and surgical cases than any other system or disease process, and half of all military disability cases (Grimm et al, 2019). - Primary care provider knowledge in MSKI is regarded as inadequate through all levels of medical education in the United States (Battistone et al, 2017). - Approx. 1801 new MSK injuries at Fort Hood per year (Health of the Force Report, 2020), approximately 19% of all MSKI within the DOD are related to the knee (Grimm et al, 2019). - DOD pays greater than \$3.7 billion annually, and the VA systems pays more than \$43 billion annually caring for MSKI (Grimm, et al 2019) - Knee X-ray cost around \$190 (Nationwide Children's Hospital, 2021) - CT w/out contrast \$1200 (Northwest radiology, 2021) - MRI w/out contrast \$2000 (Northwest radiology, 2021)

Recommendation and Rationale <i>Make a choice</i>
Recommendation <i>Make a choice</i>
Proposal is to recommend alternative #2: 3 day "mini residency" program for shoulder and knee assessment.

Rationale <i>Make a choice</i>
Battistone et al (2016), demonstrated improvement of assessments skills after the 3-day mini residency program, validated by Observed Structured Clinical Examinations by two hundred and twelve participants with a mean score of 90% for shoulder and 86% for knee exam skill proficiency. Additionally, post-course self-assessments scored higher than pre-course self-assessments for provider confidence in assessing and managing shoulder/knee complaints (Battistone et al, 2016)

Value Based Care - Investment Required by the Organization and the Associated "VALUE" or \$ GAINED. <i>Below represents two ways to present this information. Depending on the initiative, you may need to alter this outline. Please adjust as appropriate and if need be ... do not hesitate to create this portion on a separate document and then attach to this assignment. Outlines the Value Based Care</i>
LAYOUT IDEA #2

I. *Volume projection based on: Fort Hood, TX has an approximate volume of 34,000 active-duty personnel, and an injury rate of 1,801 newly diagnosed injuries per 1000 person-year (Health of the Force Report, 2020). 19% of injuries are related to the knee- approx. 324 new knee injuries per year (Grimm et al, 2019). Shoulder injuries are less frequent than knee injuries but unable to find exact statistics. Estimated at 8% of all injuries at Ft Hood are shoulder in origin, which is about 144 new shoulder injuries per year. Assuming all 100% of knee and shoulder injuries are referred for MRI, CT, and X-ray studies. These numbers only reflect active-duty personnel, no dependents, or retirees.*

324 knee injuries x \$2000 MRI	\$684,380
324 knee injuries x \$1200 CT	\$410,628
324 knee injuries x \$190 X-ray	\$61,560
Total	\$1,156,568
144 shoulder injuries x \$2000 MRI	\$288,000
144 shoulder injuries x \$1200 CT	\$172,800
144 shoulder injuries x \$190 X-ray	\$27,360
Total	\$488,160
Knee and Shoulder Grand Total	\$1,644,728

II. *Reimbursement calculated for: 75%, 50%, and 25% of all knee and shoulder injuries referred for MRI, CT, and Xray studies. All figures are estimated.*

75% MRI, CT, Xray referrals for knee injuries	\$332,798 savings
50% MRI, CT, Xray referrals for knee injuries	\$578,284 savings
25% MRI, CT, Xray referrals for knee injuries	\$867,426 savings
75% MRI, CT, Xray referral for shoulder injuries	\$122,040 savings
50% MRI, CT, Xray referral for shoulder injuries	\$244,080 savings
25% MRI, CT, Xray referral for shoulder injuries	\$366,120 savings

III. *Costs:*

Variable Costs:

Supplies (Advertising materials, teaching materials -booklets, competency checklists, pre/post surveys, writing utensils, posters)	\$ 1500 estimated
Paid training for participants - 15 providers (5NPs, 10 MDs) per iteration. NPs average is \$54.85/hr. (nursingprocess.org, 2021), MDs average is \$100.02/hr. (Salary.com, 2021) x 3 - 8hr days (24 total hours)	\$ 30,582 estimated
Support personnel (2 CNA/Medics, 3 Observers for OSCE grading MD level) Average CNA 15.61/hr. x24hrs (Salary.com, 2021), and average MD 100.02/hr. x24hrs (Salary.com, 2021)	\$7949 estimated
Train the trainers CPT Daniel/MAJ Kimmel (2 trainers x 3 days, travel to Salt Lake City, per diem (\$192/day x 3 days x 2 personnel [Federalpay.org, 2021], air fare	\$8078 estimated

(\$177x2[GSA.gov, 2021]), and rental car (\$59.00/day x 3 days [defensetravel.dod.mil, 2021]), paying 2 trainers from VHA x 3 days (MDs 100.02x24hrs)	
Total	\$48,109

Fixed Costs:

Labor (Paid training, train the trainer, and support personnel- also included in variable costs)	\$46,609
Overhead (Use of facility, lights, gas, HVAC, computers, projectors, etc.) Estimate \$1000/day	\$3000
Total	\$ 49,609

IV. Forecasted P&L statement: Assuming a 25% reduction in referrals to MRI, CT, Xray for all new knee and shoulder injuries.

Revenues:

Reduction of MRI, CT, X-ray studies for knee/shoulder injuries by 25%	\$ 454,838 per yr.
Total	\$ 454,838
revenues	

Costs:

Variable costs	\$48,109
Fixed costs	\$3,000
Total costs	\$51,109

PROJECTED PROFIT \$ 403,729 (Savings w/ 25% reduction in use of MRI, CT, X-ray for shoulder/knee assessment)

Risks and Mitigation Plan *Consider the risks:*

Risks	Plan
1. Concern for HIPAA/PHI with storage of baseline and post training chart audit results.	1. Data will be anonymized once collected to alleviate concerns for spillage of HIPAA/PHI.
2. Training curriculum does not achieve positive results.	2. Coordinate with study authors to get validated training materials.
3. Staffing requirements limits ability for target audience to utilize training	3. Utilize rotational training schedule as much as possible to limit training providers time away from clinical focus.
4. Leadership fails to give adequate support	4. Use baseline data to show potential for improved resource utilization of program supported
5. Physical assessment improvement due to training lost over time	5. Create sustainment plan

Implementation Plan *Implementation plan*

Phase 1:	Gather Evidence
Milestone Description:	Conduct research database review of available research on physical assessment training programs for primary care providers. Gather baseline information of number of shoulder and knee complaints. Also, the use of imagery or referral services for these complaints. Gathered data is to be used to measure potential benefits. Data is also needed for pre and post training program evaluation.

Deliverables	Due Date	Accountable Person
Critique of at least ten evidence-based papers regarding physical assessment training programs. Collection of baseline data: # of knee and shoulder complaints, # and type of requested imagery for complaints, # of referrals for complaints.	Two months	Principle POC's/Investigators
Resources Needed		
Time to conduct search of research databases and perform critiques of studies. Access to health records of institutions. Time to conduct chart audits to collect baseline data for pre and post training analysis.		
Expected Level of Benefit		
This phase sets the foundation to gather support for proposals through presentation of evidence. Collection of baseline data also allows for analysis of potential benefits. Lastly, data gathered allows analysis of whether proposed training program is effective and justify its costs.		
Phase 2: Dissemination of findings		
Milestone Description:	Conduct meetings with clinic/hospital leadership to present findings of gathered research and present proposal. Measurable goal: Achieve authorization from leadership to conduct project proposal.	
Deliverables	Due Dates	Accountable Person
Create the project presentation for delivery to stakeholders to achieve buy-in. (Slideshows, posters, flyers, and emails)	One month (Three months from start of project)	Principle POC's/Investigators
Resources Needed		
Time to create presentation materials. Access to clinic/hospital leadership schedule to coordinate times in which the project can be presented and gain feedback or approval. To promote the professional nature of project presentations, enlist colleagues to review data and presentation prior to submission to leadership.		
Expected Level of Benefit		
Getting the buy-in of institutional leadership allows for organizational resources needed for project success.		
Phase 3: Create/coordinate initial pilot training program. Gain approval for final project design.		
Milestone Description:	The training program for improving physical assessment skills must align with critiqued and approved previously published projects. Leadership will be needed as personnel availability of staff will be needed for the project to succeed.	
Deliverables	Due Dates	Accountable Person
Generate written plan and training materials for review, editing and approval.	3 months after leadership approval to proceed. (6 months from start of the project)	Principle POC's/Investigators
Resources Needed		
Selection and training of initial pilot group individuals. Training conducted either through coordinated use of preexisting training materials and subject matter experts or temporary duty to location of training depending on the CAO selected by leadership. Facility space for training to be conducted. Administration of written exam and surveys both pre and post training.		
Expected Level of Benefit		
Execution of the project with the limited pilot population of providers will allow for demonstration of proof of concept. With demonstration of the proof of concept increased institutional support through increased resources can be expected.		
Phase 4: Conduct training program for goal population at large within the target institution.		
Milestone Description:	Considerable number of primary care providers trained from multiple different areas of institution.	
Deliverables	Due Dates	Accountable Person

Target audience population participates in the training program.	Three months after the pilot training program completed. (9 months from the start of the project)	Principle POC's/Investigators Pilot training personnel Institutional leadership
Resources Needed		
Scheduled time for the target audience to participate in the training program. Scheduled time for the pilot training individuals to conduct follow on training for the target audience. Facility space in which the training program can be conducted. Administration of written exam and surveys both pre and post training.		
Expected Level of Benefit		
Primary care providers working within the institution have increased competence and confidence in their physical assessment skills for patients with shoulder and knee complaints.		
Phase 5: Evaluation of the Program		
Milestone Description:	Track results: Number of primary care providers trained. Compare providers before training, with their after-training test and survey results. Compare baseline institutional training referral and imaging numbers prior to and after training.	
Deliverables	Due Dates	Accountable Person
Deliver analysis results to leadership one month after the training program and 6 months after.	One month after and then 6 months after training. (10 months and 16 months after start of the project)	Principle POC's/Investigators
Resources Needed		
Time to conduct data collection and analysis. Institutional access to patient records to gather required post training data for comparison with baseline data.		
Expected Level of Benefit		
Data analysis will allow for leadership to engage program effectiveness via cost benefit analysis to determine if program is sustainable for future training events.		

NOTE: Modified from Harvard Business Review Press. (2011). *Pocket mentor: Developing a business case*. Boston: Author (pp 82-85).

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Appendix D

Observed Structured Clinical Examination Checklist



Shoulder Physical Examination

	Examination Item	Performed	Adequate Technique
1	Observation		
	Exposure	0 1 2	Observe as they disrobe for discomfort
	General posterior observation	0 1 2	Symmetry, scars, lesions, atrophy
	Scapular winging/dyskinesia	0 1 2	Patient raises arms bilaterally; wall press
2	Palpation		
	Sternoclavicular joints	0 1 2	
	Acromioclavicular joints	0 1 2	
	Biceps tendons	0 1 2	
	Subacromial space	0 1 2	Lateral and posterolateral
3	Range of Motion (ROM)		
4	Motor Function of Rotator Cuff		
	<i>Bilateral</i>		
Supraspinatus	ROM: Active abduction in scapular plane Painful arc (>90°) Drop arm test	0 1 2	Scapular plane, neutral rotation Allow for full active adduction
	Motor: Empty Can Test	0 1 2	Scapular plane, full pronation Resisted abduction lower than 90°
Infraspinatus	ROM: Active external rotation	0 1 2	Elbows at side
	Motor: Active external rotation against resistance	0 1 2	Elbows at side Start with hands near midline
	<i>Unilateral</i>		
Subscapularis	Motor: Belly Press Test	0 1 2	Hand on abdomen, elbow anterior to midline Examiner pulls at forearm Watch for elbow to drop
	ROM: Active internal rotation along spine	0 1 2	Observe patient from behind
	Motor: Lift Off Test	0 1 2	Hand at lumbar spine Actively lifts arm off back, resistance at wrist
Teres Minor	ROM: Active external rotation with 90° shoulder abduction and 90° elbow flexion	0 1 2	90° shoulder abduction & 90° elbow flexion Active external rotation
	Motor: Hornblower's Test	0 1 2	External rotation as above against resistance
	<i>Note: Check passive ROM if active is limited. This will help identify a mechanical block versus weakness or pain</i>		
5	Provocative Testing		
	<i>Impingement Testing</i>		
	Hawkin's Test	0 1 2	Shoulder 90° abduction in scapular plane 90° elbow flexion, internal rotation + horizontal adduction
	Neer's Test	0 1 2	Elbow extended, arm in full pronation Maximal passive forward elevation of shoulder with scapular stabilization
	<i>Biceps Testing</i>		
	Speed's Test	0 1 2	Hand in supination 60° forward elevation, 20-30° elbow flexion Apply downward pressure to forearm
	Yergason's Test	0 1 2	Elbow at side, 90° flexion; palm in supination Resisted supination
	<i>Acromioclavicular Joint Testing</i>		
	Cross-arm Test	0 1 2	Active horizontal adduction
Scoring: 0 = item not performed. 1 = item performed but technique not adequate. 2 = item performed correctly.			



Appendix E

Provider Confidence Self-Assessment Survey



MUSCULOSKELETAL CENTER OF EXCELLENCE EDUCATION WEEK POST-COURSE EVALUATION

Name: _____ Date: _____

1. How important is it for you to be competent in the evaluation of **shoulder pain**?

Not at all Important	Slightly Important	Moderately Important	Quite Important	Extremely Important
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With regards to **shoulder pain**, how confident are you in your ability to...

2. Perform a thorough physical examination of the shoulder?

Not at all Confident	Slightly Confident	Moderately Confident	Quite Confident	Extremely Confident
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3. Diagnose common causes of shoulder pain with a history and physical alone (without imaging)?

Not at all Confident	Slightly Confident	Moderately Confident	Quite Confident	Extremely Confident
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4. Understand when x-rays are needed to evaluate shoulder pain?

Not at all Confident	Slightly Confident	Moderately Confident	Quite Confident	Extremely Confident
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5. Understand when MRI is needed to evaluate shoulder pain?

Not at all Confident	Slightly Confident	Moderately Confident	Quite Confident	Extremely Confident
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6. Develop an appropriate management plan to treat shoulder pain?

Not at all Confident	Slightly Confident	Moderately Confident	Quite Confident	Extremely Confident
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7. Understand when to refer a patient to specialty care for shoulder pain?

Not at all Confident	Slightly Confident	Moderately Confident	Quite Confident	Extremely Confident
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Appendix F

Internal Review Board Determination Letter



DEFENSE HEALTH AGENCY
CENTRAL TEXAS MILITARY HEALTH SYSTEM
36065 SANTA FE AVENUE
FORT HOOD, TEXAS 76544-5060

MCXI-QPS-HP

November 16, 2022

MEMORANDUM FOR MAJ Justin Kimmel

SUBJECT: Determination of Not Research

PROTOCOL TITLE: Improving the shoulder physical examination skills for primary care providers caring for Active-Duty patients.

REFERENCE #'s: CRDAMC Reference #CRDAMC.22-25, EIRB Reference #956047

REVIEW TYPE: Administrative

ACTION: NOT RESEARCH STATUS DETERMINATION

1. The Carl R. Damall Army Medical Center (CRDAMC) Human Research Protections Office (HRPO) received the above-referenced project dated 6 November 2022 for review of applicability of human subjects protections regulations.
2. The CRDAMC Human Protections Director (HPD) has reviewed your proposed project and has determined that your project does not meet the definition of research as defined under 32 CFR 219.102(l).
3. Research is defined under 32 CFR 219.102(l) as follows: "Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge."
4. Based on the information you provided, the project was determined to be "not research" for the following reasons:
 - a. The project is not designed to contribute to generalizable knowledge. The project is not designed to influence theory or future research designs.
 - b. The intent of this Performance/Quality Improvement project is to improve the shoulder exam physical assessment skills of the Fort Hood primary care providers.
5. Because the project has been determined to be "not research", it is not subject to further review from the CRDAMC HRPO. **This determination should not be construed as approval to initiate the project. Other institutional approvals may be required** and should be coordinated through your department.

MCXI-QPS-HP
Subject: 22-25_Determination of Not Research

6. Because this is a Performance/Quality Improvement project, please ensure you work with the appropriate staff going forward. The POC for QI/PI/EBP projects is Kerry Perez, at kerry.r.perez.civ@mail.mil or (254) 553-1962.

7. You are reminded that you must still comply with all HIPAA regulations and policies, including DoDM 6025.18, which may require further approvals or other documentation that you are responsible for obtaining. These requirements are outside the scope of the CRDAMC HRPO. For HIPAA related assistance please contact CRDAMC's HIPAA Privacy Officer or Security Officer at usarmy.hood.medcom-crdamc.mbx.hipaa@mail.mil.

8. Please be reminded that your project **may become research subject to IRB review** if it becomes and/or includes a systematic investigation to develop or contribute to generalizable knowledge. In the event there is a change to the above-described project that may affect its determination, please contact your CRDAMC HRPO who will re-evaluate the project and determine if a research protocol must be submitted in eIRB.

9. You are reminded that **publication clearance is required prior to the release of any information outside of the institution**. Please refer to the Public Affairs Office (PAO) for specific requirements.

10. The POC for this review is the CRDAMC HPD at usarmy.hood.medcom-crdamc.mbx.research@mail.mil or (254) 553-9779.

Signature applied by Dawn Marie Beaver on 11/16/2022 09:21:13 AM CST

Dawn Beaver
Human Protections Director

Appendix G

Committee Membership Agreement



Appendix C: Daniel K. Inouye Graduate School of Nursing
DNP Project Team Mentor (Committee Membership) Agreement Form

DOCTOR OF NURSING PRACTICE PROJECT DNP Project Clinical Question and Team Mentor (Committee Membership) Agreement Form

Graduation Year: 2023

Name(s) of DNP Project Student Team:

1. MAJ Justin Kimmel Phase II Site: AGCNS FNP PMHNP RNA WHNP
2. CPT LeeAnna Moore Phase II Site: AGCNS FNP PMHNP RNA WHNP
3. _____ Phase II Site: AGCNS FNP PMHNP RNA WHNP
4. _____ Phase II Site: AGCNS FNP PMHNP RNA WHNP
5. _____ Phase II Site: AGCNS FNP PMHNP RNA WHNP
6. _____ Phase II Site: AGCNS FNP PMHNP RNA WHNP

The tentative title of the DNP Project Proposal for this student group is:

Improving the shoulder physical examination skills for primary care providers caring for active duty patients

Committee Approved DNP Project Clinical Question:

For primary care providers serving active-duty service members, does a two day intensive shoulder workshop, compared to previous practice increase provider confidence and accuracy of assessment in the diagnosis of shoulder pain?

Names of DNP Project Team Mentors (*types the name and obtain signatures*):

I agree to serve as a member of the DNP Project Team (Team Mentors) for the above DNP Student Project Team. As a Project Team Mentor, I agree to the duties and responsibilities outlined within the DNP Project Manual which include but are not limited to the provision of consultation and guidance supporting the entire DNP project journey and to ensure the DNP project is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation.

Form Version: 1 Jun 2016



Appendix C: Daniel K. Inouye Graduate School of Nursing
DNP Project Team Mentor (Committee Membership) Agreement Form

NOTE: *You may have 3-4 DNP Team Mentors [committee members including your DNP Senior Mentor (Chair)]. The Phase II Site Director may also be a member of the group, as well as other USUHS faculty or others who may serve as content experts. All non-USUHS faculty selected as a Team Mentor must be approved by the DNP Project Director.*

Senior Mentor (Chair): Williams, Janice Signature: WILLIAMS.JANIC
E.K.1550640275 Digital signed by
WILLIAMS.JANICE.K.1550640275
Date: 2022.07.18 11:18:18 -0400 Date: 18 July 22

Team Mentor (Committee): Fisher, Shara Signature: FISHER.SHARA.1000028750 Digital signed by
FISHER.SHARA.1000028750
Date: 2022.07.18 11:18:18 -0400 Date: _____

Team Mentor (Committee): _____ Signature: _____ Date: _____

Team Mentor (Committee): _____ Signature: _____ Date: _____

Appendix H

USUHS Form 3202N VPN Approval

USUHS FORM 3202N
DANIEL K. INOUE GRADUATE SCHOOL OF NURSING
EVIDENCE-BASED PRACTICE/PERFORMANCE IMPROVEMENT PROPOSAL

VPR Date Stamp

Project Number: GSN-61-13137 (VPR will assign)

Project Title: Improving the shoulder physical examination skills for primary care providers caring for active duty patients

SECTION A: STUDENT POC INFORMATION	
1. Name (Last, First, MI): <u>Kimmel, Justin W.</u>	Student E-mail: <u>justin.kimmel@usuhs.edu</u>
2. Home Address: <u>[REDACTED]</u>	Cell Number: <u>[REDACTED]</u>
SECTION B: COMMITTEE CHAIR / SENIOR MENTOR INFORMATION	
3. Name (Last, First, MI): <u>Williams, Janice, K.</u>	
4. Telephone: <u>[REDACTED]</u>	Fax: <u>[REDACTED]</u> E-mail: <u>janice.williams@usuhs.edu</u>
5. USUHS Building/ Room No.: <u>E1052</u>	
SECTION C: PROJECT INFORMATION	
6. Attach the Abstract for the proposal, including the following sections: Site Location of the Project, Title, Authors, Background or Problem/Issue, Clinical Question/Purpose, Project Design, Anticipated Organizational Impact/Implications for Practice and also include the Proposed Timeline. Single space the abstract and use Times New Roman font, size 12.	
7. Is this proposal related to an active research project of the Chair/Senior Mentor identified in Section B? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, complete below; if no, proceed to Part 8. Project Number: <u>[REDACTED]</u> Project Title: <u>[REDACTED]</u> Project Start Date: <u>[REDACTED]</u> Project End Date: <u>[REDACTED]</u>	
8. Anticipated period of performance: Project Start Date: <u>7/1/2022</u> Project End Date: <u>4/7/2023</u>	
9. Performance Site(s): <u>CRDAMC Fort Hood, TX</u>	
10. Does this project involve any classified information? (Contact the USUHS Security Office for guidance) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
11. Do you have a funding source for this project? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA If yes, specify the funding agency and the amount provided: <u>[REDACTED]</u>	
SECTION D: SIGNATURES	
The following signatures attest to the validity of the above information:	
KIMMEL.JUSTIN.WILLIAM.1097411189 <small>Digitally signed by KIMMEL JUSTIN WILLIAM 1097411189 Date: 2022.07.06 20:16:14 -0500</small> Student (Project Point of Contact for the Group) (Signature and Date)	WILLIAMS.JANICE.K.1550640275 <small>Digitally signed by WILLIAMS JANICE K.1550640275 Date: 2022.11.21 06:42:49 -0500</small> Chair/Senior Mentor (Signature and Date)
JOHNSON.HEATHER.L.1073935110 <small>Digitally signed by JOHNSON HEATHER L.1073935110 Date: 2022.11.21 09:35:55 -0500</small> Chair/Program Director (Signature and Date)	[REDACTED] <small>[REDACTED]</small> Chair/Program Director (Signature and Date)
[REDACTED] <small>[REDACTED]</small> DNP Project Director or PhD Director (Signature and Date)	SEIBERT.DIANE.C.1084932279 <small>Digitally signed by SEIBERT DIANE C.1084932279 Date: 2022.11.21 15:04:05 -0500</small> Associate Dean for Academic Affairs, GSN (Signature and Date)
SIMMONS.ANGELA.MARIE.1143313375 <small>Digitally signed by SIMMONS ANGELA MARIE.1143313375 Date: 2022.12.01 20:48:31 -0500</small> Associate Dean for Research, GSN (Signature and Date)	ROMANO.CAROL.A.1032050294 <small>Digitally signed by ROMANO CAROLA.1032050294 Date: 2022.12.01 21:21:26 -0500</small> Dean, DKI Graduate School of Nursing (Signature and Date)
In light of the above signatures, the project is approved. WOODBERRY.MITCHEL.L.WAYNE.1080957114 <small>Digitally signed by WOODBERRY MITCHELL WAYNE 1080957114 Date: 2023.01.19 06:11:43 -0500</small> USUHS Vice President for Research Date: <u>[REDACTED]</u>	

Appendix I

DNP Verification Form



Appendix G: Daniel K. Inouye Graduate School of Nursing
DNP Project Completion Verification Form

DOCTOR OF NURSING PRACTICE PROJECT
Completion Verification Form

The DNP Project titled:

Improving the shoulder physical examination skills for primary care providers caring for active-duty patients

was completed at: Carl R. Darnall Army Medical Center - Fort Hood, TX

by the following student(s):

(type student name)	(signature)	(date)
LeeAnna Moore	MOORE.LEEANNA.CAROL.1 263536564 <small>Digitally signed by MOORE.LEEANNA.CAROL.1263536564 Date: 2023.04.17 16:16:52 -0500</small>	04/17/2023
Justin Kimmel	KIMMEL.JUSTIN.WILLIAM.1 097411189 <small>Digitally signed by KIMMEL.JUSTIN.WILLIAM.1097411189 Date: 2023.04.27 09:09:59 -0500</small>	04/27/2023
	<small>Signature</small>	
	<small>Signature</small>	
	<small>Signature</small>	

The DNP Practice Project Team verifies that the following components of the DNP project, accomplished by the above students, is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation:

- Presentation of DNP project to the leadership/stakeholders at the Phase II Site,
- Abstract/Impact Statement (*Appendix F*), and
- DNP Project written report.

Verified by:

	(type name)	(signature)	(date)
Senior Mentor:	Dr. Janice Williams	WILLIAMS.JANICE.K.1550640275 <small>Digitally signed by WILLIAMS.JANICE.K.1550640275 Date: 2023.04.26 08:27:12 -0400</small>	
Team Mentor:		<small>Signature</small>	
Team Mentor:		<small>Signature</small>	
Phase II Site Director:	LTC Shara Fisher	FISHER.SHARA.1008098758 <small>Digitally signed by FISHER.SHARA.1008098758 Date: 2023.04.26 07:52:09 -0500</small>	

For RNA Students only - add the following additional signature for final verification of project completion:

	<small>Signature</small>	
RNA Project Director (type name)	(Signature)	(Date)

Appendix J

Ft Hood Project Timeline

Shoulder Assessment Workshop									
Activity/Month	2022					2023			
	AU G	SEP	OC T	NO V	DEC	JA N	FE B	MA R	AP R
USUHS VPR Submission and Approval	X	X	X	X					
Site IRB Submission and Approval	X	X	X	X					
Project Planning -Task 1: Stakeholder engagement meetings -Task 2: Refinement of training calendar -Task 3: Recruit Trainers and Trainees	X	X	X	X	X				
Project Implementation/Data Collection -Task 1: Conduct pre training questionnaire -Task 2: Conduct 1-day training events - Proposed Workshop dates -- 27Jan, 3Feb, and 10Feb -- Minimum of one event, the goal of 2-3 events -Task 3: Collect post training questionnaire						X	X		
Data Analysis -Task 1: Compile and analyze provider questionnaire pre and post training data -Task 2: Compile and analyze post training after action review comments							X	X	
Dissemination -Task 1: Create paper explaining EBP project design, execution, and results -Task 2: Create briefing presentation and posters -task 3: Present results to stake holders and other interested parties								X	X

Appendix K
Citi Certificates



Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42116383

This is to certify that:

Justin Kimmel

Has completed the following Citi Program course:

Not valid for renewal of certification through CME.

OUSD P&R Human Research
(Curriculum Group)
Biomed Research Coordinators, Clinical Coordinators, Study Coordinators & Research Administrators
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)



Verify at www.citiprogram.org/verify/?w7be3e067-a2f2-48f1-b688-a1f6d05ab3aa-42116383



Completion Date 06-Apr-2021
Expiration Date 05-Apr-2024
Record ID 41967837

This is to certify that:

Justin Kimmel

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

OUSD P&R Human Research
(Curriculum Group)

Biomedical Investigators and Research Study Team
(Course Learner Group)

1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)



Verify at www.citiprogram.org/verify/?w02705dd4-20e1-4285-a58b-2001b8ed9a88-41967837



Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42081275

This is to certify that:

Justin Kimmel

Has completed the following Citi Program course:

Not valid for renewal of certification through CME.

OUSD P&R Human Research
(Curriculum Group)
Biomedical Research Support Staff
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)



Verify at www.citiprogram.org/verify/?w1c2d70de-8e94-4aff-a09f-ccc375e19f69-42081275



Completion Date 09-Apr-2021
Expiration Date 08-Apr-2024
Record ID 41967839

This is to certify that:

Justin Kimmel

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

GCP – Social and Behavioral Research Best Practices for Clinical Research

(Curriculum Group)

GCP – Social and Behavioral Research Best Practices for Clinical Research

(Course Learner Group)

1 - Basic Course

(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)



Verify at www.citiprogram.org/verify/?w2a0abf29-3a6e-4bb0-b538-45729871adc2-41967839



Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42081276

This is to certify that:

Justin Kimmel

Has completed the following CITI Program course:

Not valid for renewal of certification
through CME.

Good Clinical Practice (U.S. FDA Focus)

(Curriculum Group)

GCP for Clinical Trials with Investigational Drugs and Medical Devices (U.S. FDA Focus)

(Course Learner Group)

1 - GCP

(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wcbd56436-d1c3-48c4-bfba-7ecc79f601db-42081276



Completion Date 12-Apr-2021
Expiration Date 11-Apr-2024
Record ID 41967838

This is to certify that:

Justin Kimmel

Has completed the following CITI Program course:

Not valid for renewal of certification
through CME.

Responsible Conduct of Research (RCR)

(Curriculum Group)

Responsible Conduct of Research (RCR)

(Course Learner Group)

1 - Basic Course

(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w951639fa-0b3d-465c-8441-c6060bebec2d-41967838



Completion Date 16-Apr-2021
Expiration Date 15-Apr-2024
Record ID 42081274

This is to certify that:

Justin Kimmel

Has completed the following Citi Program course:

Not valid for renewal of certification
through CME.

OUSD P&R Human Research

(Curriculum Group)

Social and Behavioral Investigators and Research Study Team

(Course Learner Group)

1 - Basic Course

(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w7d883dd3-bf5b-4e18-9efe-9fbe83277ed4-42081274



Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42073474

This is to certify that:

LeeAnna Daniel

Has completed the following CITI Program course:

OUSD P&R Human Research

(Curriculum Group)

Biomedical Investigators and Research Study Team

(Course Learner Group)

1 - Basic Course

(Stage)

Not valid for renewal of certification
through CME.

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wc6e85c5c-6d23-4333-9b36-1b8604dbc3d8-42073474



Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42073477

This is to certify that:

LeeAnna Daniel

Has completed the following CITI Program course:

Not valid for renewal of certification
through CME.

OUUSD P&R Human Research

(Curriculum Group)

Biomed Research Coordinators, Clinical Coordinators, Study Coordinators & Research Administrators

(Course Learner Group)

1 - Basic Course

(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w40ba0f52-6274-4db1-857b-47865d9dc0a2-42073477



Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42073476

This is to certify that:

LeeAnna Daniel

Has completed the following Citi Program course:

OUSD P&R Human Research

(Curriculum Group)

Biomedical Research Support Staff

(Course Learner Group)

1 - Basic Course

(Stage)

Not valid for renewal of certification
through CME.

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w37986da5-1e15-4eaf-bccb-60f93054333e-42073476



Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42073478

This is to certify that:

LeeAnna Daniel

Has completed the following CITI Program course:

Not valid for renewal of certification
through CME.

Good Clinical Practice (U.S. FDA Focus)

(Curriculum Group)

GCP for Clinical Trials with Investigational Drugs and Medical Devices (U.S. FDA Focus)

(Course Learner Group)

1 - GCP

(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w364f221f-51cc-42c1-8934-edd9de5db587-42073478



Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42073479

This is to certify that:

LeeAnna Daniel

Has completed the following CITI Program course:

Not valid for renewal of certification
through CME.

Responsible Conduct of Research (RCR)

(Curriculum Group)

Responsible Conduct of Research (RCR)

(Course Learner Group)

1 - Basic Course

(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wf61be246-ab1f-4d4d-982e-28e4245e3403-42073479



Completion Date 13-Apr-2021
 Expiration Date 12-Apr-2024
 Record ID 42073480

This is to certify that:

LeeAnna Daniel

Has completed the following CITI Program course:

Not valid for renewal of certification
 through CME.

GCP – Social and Behavioral Research Best Practices for Clinical Research

(Curriculum Group)

GCP – Social and Behavioral Research Best Practices for Clinical Research

(Course Learner Group)

1 - Basic Course

(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
 Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wa346facc-a7be-4af7-9104-e1fa2d7ec668-42073480



Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42073475

This is to certify that:

LeeAnna Daniel

Has completed the following Citi Program course:

Not valid for renewal of certification
through CME.

OUSD P&R Human Research

(Curriculum Group)

Social and Behavioral Investigators and Research Study Team

(Course Learner Group)

1 - Basic Course

(Stage)

Under requirements set by:

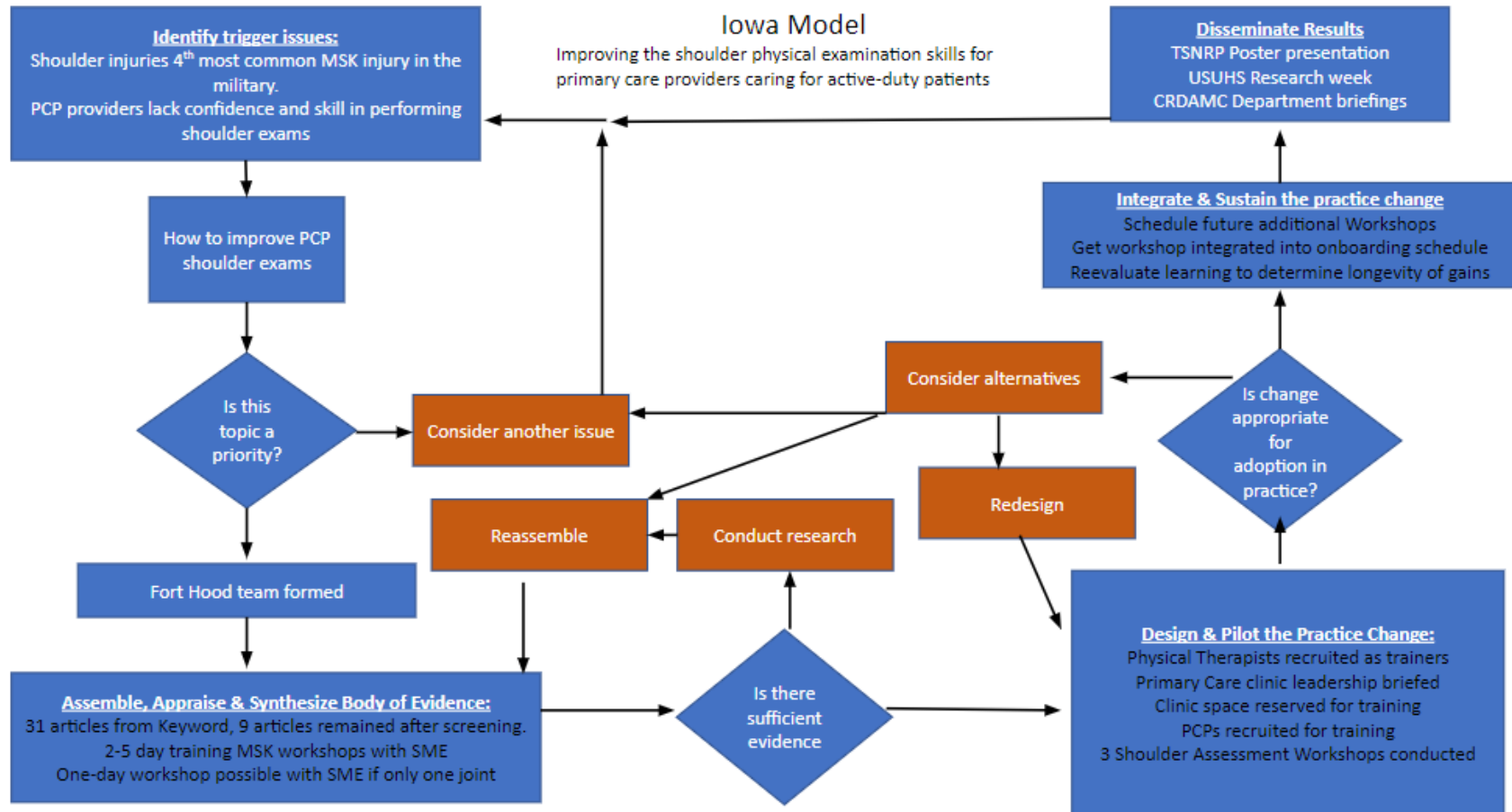
Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w1160825d-08dc-4765-8679-cfcc953c05e4-42073475

Appendix L

Application of the Iowa Model



Improving Shoulder Assessment Skills in Primary Care Providers of Active-Duty Service Members at Fort Hood, TX

MAJ Justin Kimmel & CPT(P) LeeAnna Moore
Senior Mentor – Dr. Janice Williams

DNP Project Team:

Phase II Site Director – LTC Shara Fisher
MTF – Carl R. Darnall Army Medical Center
The Daniel K. Inouye Graduate School of Nursing

Disclaimer

- The views expressed in the presentation are those of the authors and do not necessarily reflect the official policy or position of the Uniformed Services University, the Department of Defense, United States Government, or Veterans Administration
- There are no financial relationships that exist between the speakers and a commercial entity

Introduction

- Musculoskeletal injuries (MSKIs) are common among civilian population and the Department of Defense (DoD)
 - Account for 2 million outpatient encounters annually
 - Affects approximately 800,000 Service Members per year
- Shoulder injuries are the 4th most common complaint across the DoD
 - 3rd most common injury reported during combat deployment to Afghanistan

Significance

- Key leaders identified a need to improve MSKI assessment skills for Primary Care Providers (PCPs)
- Providers reported feeling a lack of adequate MSKI training
- MSKIs:
 - Cost the DoD approximately \$434 million annually
 - Significantly reduces the readiness of the force
 - MSKIs can affect SMs long after service



System or Clinical Question

- What educational program will help improve the shoulder physical assessment skills and confidence of primary care providers taking care of active duty SMs at Fort Hood, as compared to previous (usual) practice?

Literature Search Terms

Table 1. Included Online Databases

PubMed	(2006 to present)
EMBASE	(2006 to present)

Table 2. Search Terms and Strategy

Concept 1 AND Medical education methods	Concept 2 AND audience	Concept 3 Musculoskeletal
Competency Simulation Computer Assisted Learning Teaching Instruction	Students Providers Primary Care	Musculoskeletal examination Musculoskeletal assessment Joint examination Joint assessment Shoulder exam Knee exam Shoulder assessment Knee Assessment

Table 3. PRISMA

<p>31 references imported for screening as 31 studies. 14 duplicates removed. 17 studies screened against title and abstract. 0 studies excluded. 17 studies assessed for full-text eligibility. 8 studies excluded.</p> <ul style="list-style-type: none"> 4 Irrelevant 2 Wrong study design 1 Wrong intervention 1 Wrong setting <p>0 studies ongoing 0 studies awaiting classification. 9 studies included.</p>
--

***Note all searches were limited to the last 15 years and limited to articles in the English language.**

Literature Search Terms

Table 4. Inclusion and Exclusion criteria

Inclusion Criteria	Exclusion Criteria
<p>Population: Medical students Residents Physicians</p> <p>Intervention: Lectures Workshops small group learning sessions SP teachers Patient educators Peer teachers Structured clinical interviews Teaching OSCEs Simulations Videos</p> <p>Comparator: MSK Physical assessment teaching methods noted above</p> <p>Outcome: Confidence level of provider/student Observed assessment scores. written exam score</p>	<p>Population: Nurses Physiotherapists Other allied professionals</p> <p>Intervention: Shadowing/mentoring Clinical experience Practice audits</p> <p>Outcome: Procedural skills outcomes Satisfaction of teaching method</p>

- Mean duration of training 2-5 days for multiple joints
- 1-day single joint workshop also effective
- Curriculums included: didactic lecture, hands-on experiences in small groups, and clinical rotations.
- Provider competency measured by self-assessment surveys, MSK knowledge exams, and graded observed clinical experience (OSCE)

Focus Areas / Arms

- Engaged key stakeholders and identified a gap in MSK assessments in primary care
- Conducted literature review to explore best practices to close the gap
- Pilot a 1-day intensive shoulder workshop for PCPs of Active-Duty Service Members at Fort Hood, TX
- Improve PCP shoulder assessment skills and competence through a systematic and structured exam

Project Design

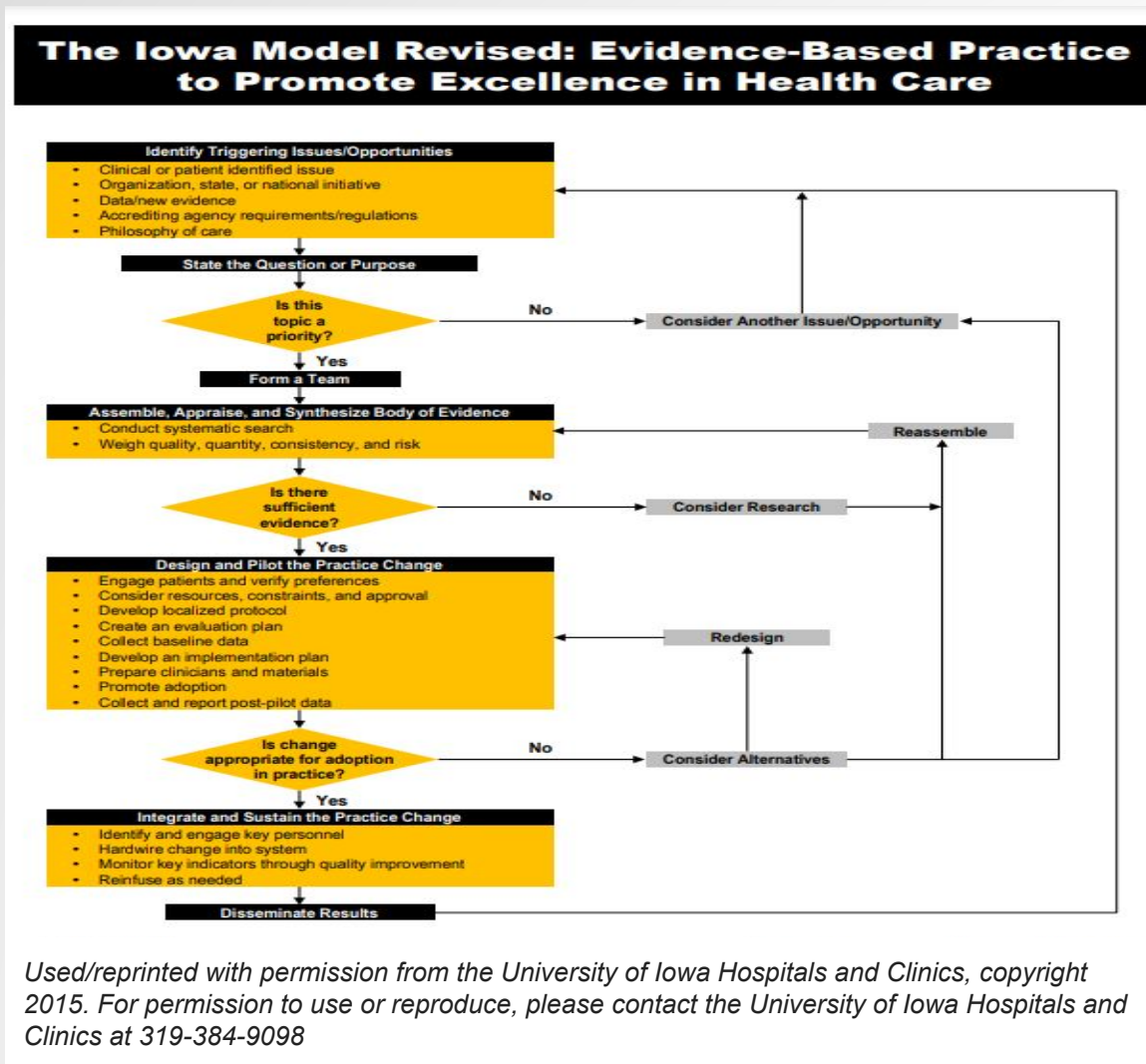
General Approach:

- Quality Improvement Project
- Program adapted with permission from Salt Lake City, UT Veterans Administration
- Pre/Post-education intervention
- 20 volunteer participants
- 3 separate training dates

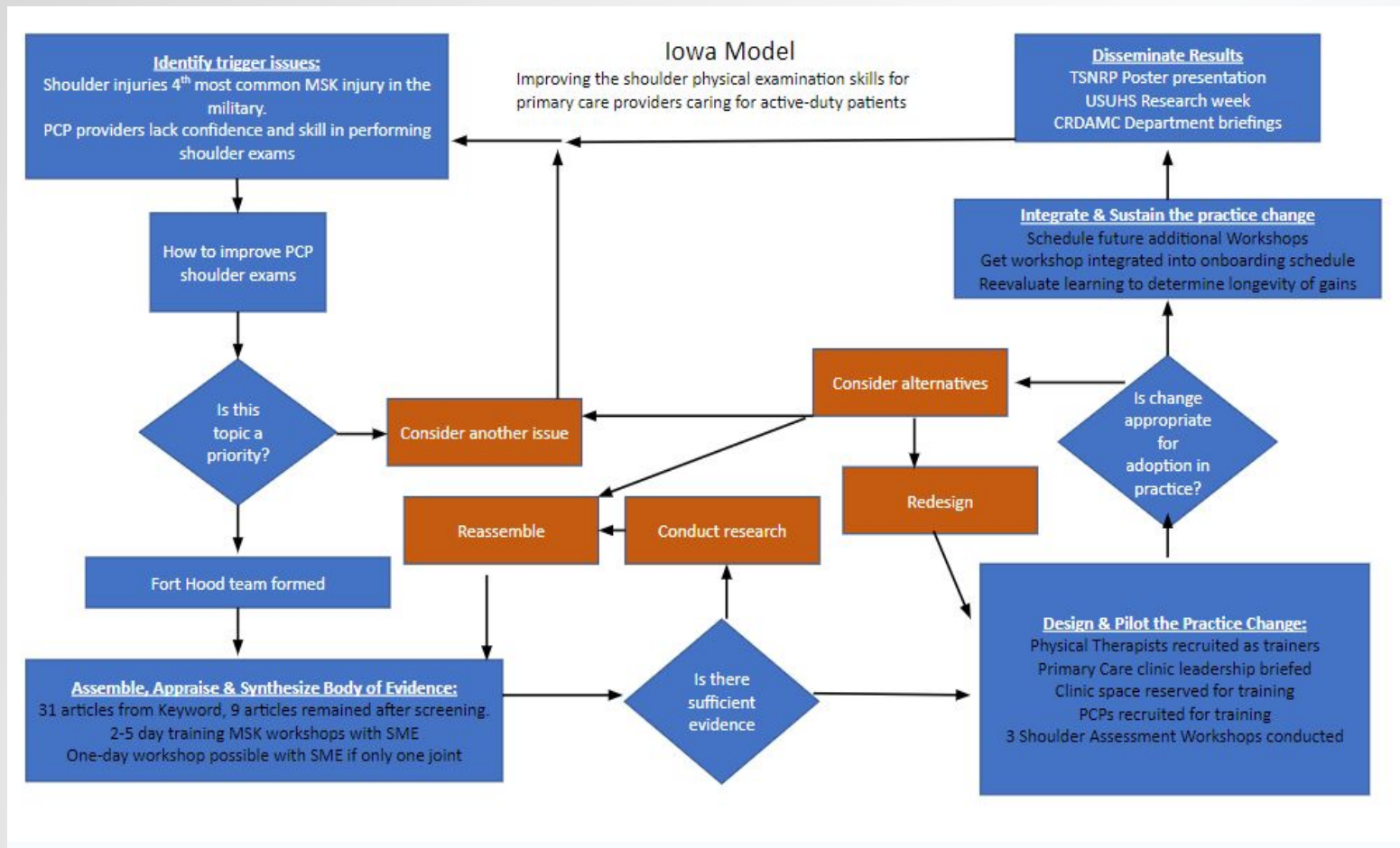
Setting:



Translation/Organizing Framework



Translation/Organizing Framework



Procedural Steps

- 4 Phases (August 2022 through May 2023)
 - Phase 1 Project Approvals and Planning
 - Phase 2 Project Implementation
 - Phase 3 Data Analysis
 - Phase 4 Dissemination Plan

Procedural Steps

- Phase 1 – Literature Review, Project Approvals and Planning (August – December 2022)
 - USUHS project proposal and approval
 - CRDAMC internal review board submission and approval
 - Key Stakeholder and leadership engagement
 - Subject matter expert recruitment

Procedural Steps

- Phase 2 - Project Implementation (January - February 2023)
 - Recruitment of participants
 - Administration of pre- and post-intervention self- assessments and graded OSCEs for baseline and comparative data
 - Conducted the training

Procedural Steps

- Phase 3 - Data Analysis Phase (February - March 2023)
 - Compiled data from pre- and post-intervention self-assessments and OSCEs
 - Performed analysis of data
 - Determine recommendations for practice change

Procedural Steps

- Phase 4 - Dissemination phase (March - May 2023)
 - Paper
 - Poster presentations
 - TSNRP (04-06APR23)
 - CRDAMC Research Day (18MAY23)
 - USUHS Research Week (16-19MAY23)

Results

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-course Scoring Rater 1	15.95	20	6.597	1.475
	Post-course Scoring Rater 1	38.15	20	3.760	.841
Pair 2	Pre-course Scoring Rater 2	18.65	20	6.627	1.482
	Post-course Scoring Rater 2	38.20	20	3.847	.860

Results

Paired Samples Test										
		Paired Differences					t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
					Lower	Upper				
Pair 1	Pre-course Scoring Rater 1 - Post-course Scoring Rater 1	-22.200	6.354	1.421	-25.174	-19.226	-15.624	19	.000	
Pair 2	Pre-course Scoring Rater 2 - Post-course Scoring Rater 2	-19.550	8.211	1.836	-23.393	-15.707	-10.648	19	.000	

Results - Interrater reliability OSCE scoring

Symmetric Measures					
		Value	Asymptotic Standard Error ^a	Approximate T ^b	Approximate Significance
Measure of Agreement	Kappa	.615	.036	5.282	.000
N of Valid Cases		21			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					

Symmetric Measures					
		Value	Asymptotic Standard Error ^a	Approximate T ^b	Approximate Significance
Measure of Agreement	Kappa	.701	.036	3.313	.001
N of Valid Cases		21			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					

Results

n	Alpha value				
	0.005	0.01	0.025	0.05	0.10
5	-	-	-	-	0
6	-	-	-	0	2
7	-	-	0	2	3
8	-	0	2	3	5
9	0	1	3	5	8
10	1	3	5	8	10
11	3	5	8	10	13
12	5	7	10	13	17
13	7	9	13	17	21
14	9	12	17	21	25
15	12	15	20	25	30
16	15	19	25	29	35
17	19	23	29	34	41
18	23	27	34	40	47
19	27	32	39	46	53
20	32	37	45	52	60
21	37	42	51	58	67
22	42	48	57	65	75
23	48	54	64	73	83
24	54	61	72	81	91
25	60	68	79	89	100
26	67	75	87	98	110
27	74	83	96	107	119
28	82	91	105	116	130
29	90	100	114	126	140
30	98	109	124	137	151

Pre and Post survey provider confidence		
Group 1 (n=8)	W test statistic = 0	Number of non-tied pairs (n) = 8
Group 2 (n=8)	W test statistic = 0	Number of non-tied pairs (n) = 8
Group 3 (n=4)	W test statistic = 0	Number of non-tied pairs (n) = 2
Combined data (n=20)	W test statistic = 0	Number of non-tied pairs (n) = 18

Results

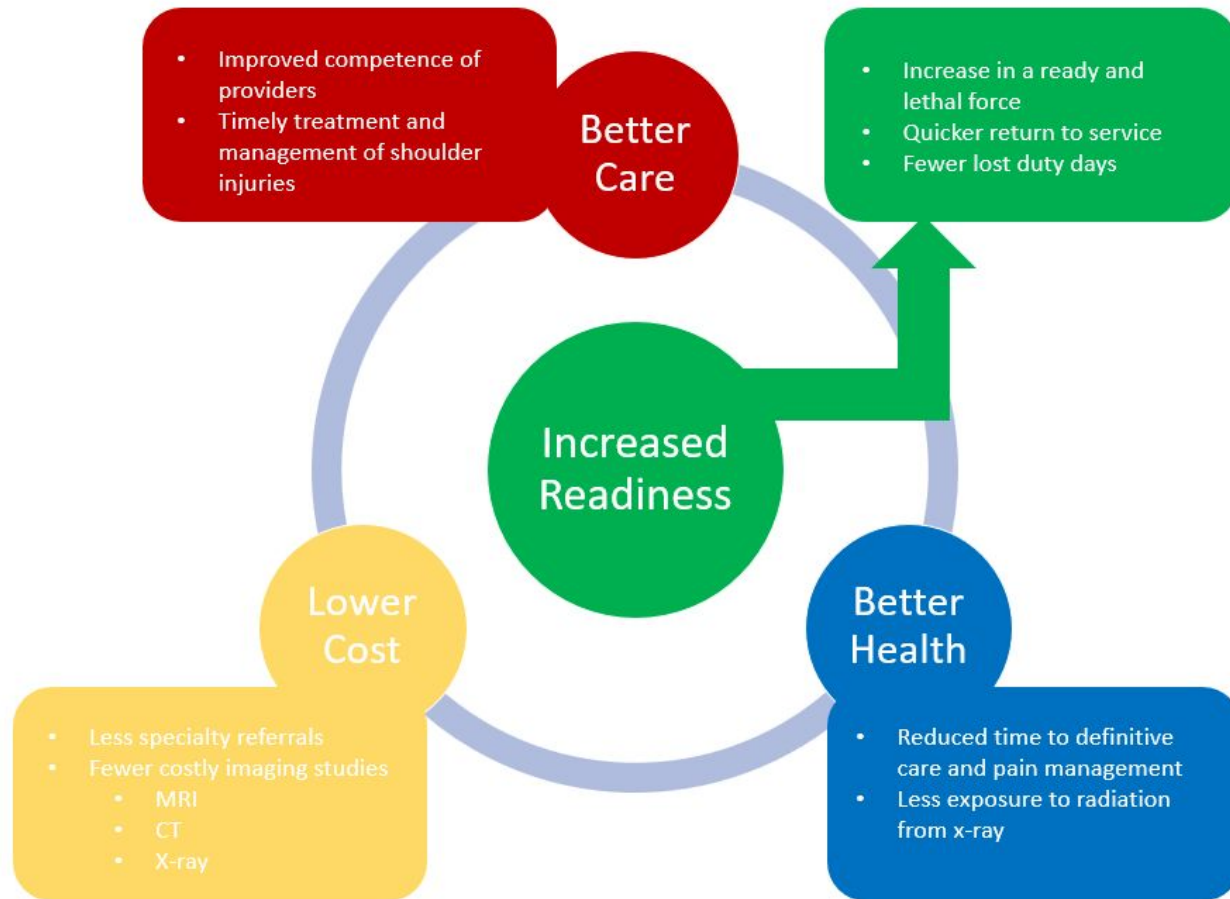
- Pre and Post course assessment of provider confidence

Totals for all training dates						
Pre Course Assessment	1	2	3	4	5	Total
Pre Course Assessment						
With regards to shoulder pain, how confident are you in your ability to...						Mean Score (Pre-course Survey)
Question #4 - Perform a thorough physical examination of the shoulder? (Number of participants making selection)		3	12	5		3.1
Points per selection		6	36	20		62
Question	1	2	3	4	5	Total
Post Course Assessment						
With regards to shoulder pain, how confident are you in your ability to...						Mean Score (Pre-course Survey)
Question #2 - Perform a thorough physical examination of the shoulder? (Number of participants making selection)			2	10	7	4.263157895
Points per selection			6	40	35	81

Analysis

- One day workshop was successful
 - Both qualitative and quantitative improvement
- Subjective recommendations also positive
- Moving to integrative stage of Iowa Model

Organizational Impact



Barriers and Limitations

- Difficulty recruiting providers for training
 - Provider time limited
 - Multi-day workshop unfeasible
- Recruitment of SMEs
- Small sample size
 - Power analysis not performed
- Data collection of post survey

Future Directions

- Follow up assessments in 6 to 8 months
- Additional training workshops dedicated to additional joints
- Incorporate joint injections into training
- Conduct research evaluating effect on patient treatment
 - Diagnostic imaging use
 - Time on profile

Conclusion

- 20 Providers impacted
- Collaborative relationship with the VA
- Symbiotic relationship with Physical Therapy
- Leadership recommendations
- Improved recruitment for future workshops
- Use of standardized exams reinforced with hands on demos



References

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Thank You!

First, we would like to extend a huge thank you to Dr. Michael Battistone and PA Andrea Barker of the Salt Lake City, UT Veterans Administration, for their support, expertise, and permission to use and adapt their educational materials for our program at Fort Hood. Without their support, this project would have been far more challenging.

Second, we would like to thank the CRDAMC physical therapy department Major Eliot Thomasma, First Lieutenant Cornelius Brady, First Lieutenant Stefanie Faull, and First Lieutenant Logan Steiert for serving as subject matter experts and educators during all three course dates. Their professionalism, teaching styles, and expertise were unparalleled, and made for an informative, fun, and interactive experience for all participants.

Lastly, we would like to thank our project mentors: Dr. Janice Williams, Dr. Laura Taylor, Dr. Jennifer Trautman, and our phase II site director Major Shara Fisher for their support, expertise, and guidance throughout all phases of our project. Their guidance was invaluable in the development of our topic and curriculum, implementation of our intervention, analysis of the results, and final dissemination of the results of our project.

Improving the shoulder physical examination skills for primary care providers caring for active-duty patients

Justin Kimmel, BSN, RN, MAJ, AN & LeeAnna Moore, BSN, RN, CPT, AN

Daniel K. Inouye Graduate School of Nursing, Uniformed Services University of the Health Sciences, Bethesda, MD



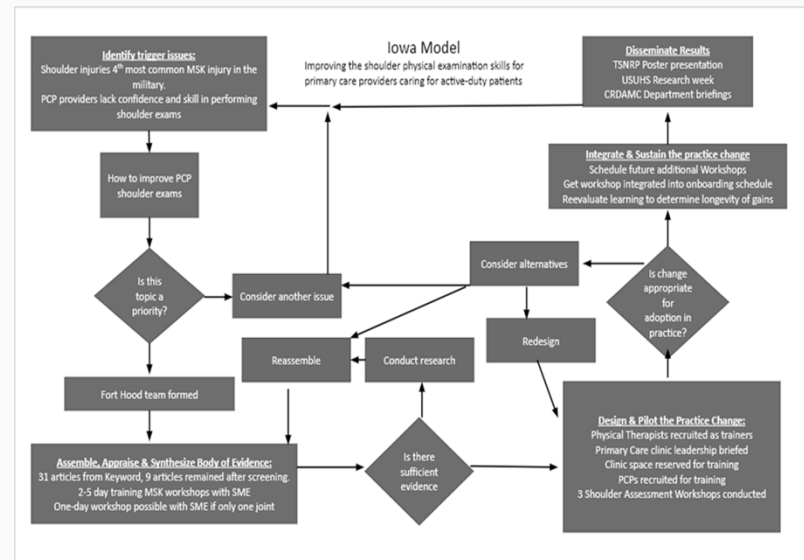
Significance of the Problem

- In 2020, shoulder injuries were the 4th leading cause of musculoskeletal injuries (MSKIs) overall within the Department of Defense (DoD)
- 3rd leading cause of injuries among Service Members (SMs) deployed to Afghanistan
- For occupational specialties associated with heavy equipment maintenance, shoulder injuries were the most common type of MSK injury
- Service Members are 20 times more likely to sustain a shoulder injury than the general U.S. public
- In the military, regarding MSK injuries of the upper extremity, 63% are shoulder injuries
- PCPs report feeling a lack of confidence, skills, or knowledge to accurately assess musculoskeletal complaints and correlating feelings to inadequate initial training
- Despite the commonality of shoulder injuries within the DoD, they are often misdiagnosed by primary care providers resulting in wide-ranging treatment outcomes, overuse of costly diagnostic imaging studies, persistent symptoms, and even premature termination from service

Purpose

Find, implement, and evaluate an effective and sustainable training program to improve the shoulder physical assessment skills for primary care providers (PCP)

Organizing Framework



Results

- Total of 20 providers participated over 3 different dates (27JAN23, 03FEB23, and 10FEB23)
- Subjective: Improvement in confidence and competency from pre- to post-intervention, as evidenced by 5 point Likert self-assessment surveys
 - Average pre-intervention survey score, 3.1 out of 5
 - Average post-intervention survey score, 4.3 out of 5
- Objective: Improvement in average point difference between pre- and post-intervention OSCE scores of 19.29 points
 - Average pre-intervention score: 17.3 points of 42 possible
 - Average post-intervention score: 38.175 points of 42 possible
- A one-day MSK training workshop is potentially a highly effective modality to improve primary care provider physical exam assessment skills
- Use of a standardized shoulder exam builds provider confidence
- Breaking standard exam teaching sections into small group breakout sessions enhanced provider learning.

Organizational Impact



Project Design

- 1-day intensive shoulder assessment course offered over 3 dates
- Pre-course competency self-assessment
- Pre-course Observed Structured Clinical Examination (OSCE)
- 4-hrs didactic instruction:
 - Shoulder anatomy review
 - Assessment skills with breakout sessions
 - Diagnostic imaging
 - Management of condition
- 1.5-hrs small group instruction with subject matter experts (SMEs)
- Post-course OSCE
- Post-course competency self-assessment
- 20-Provider participants
 - 10- Physician Assistants
 - 3- Physician's Assistant Students
 - 1- Doctor of Osteopathic Medicine
 - 1 – Doctor of Medicine
 - 5 – Family Nurse Practitioners

Shoulder Physical Examination		
Examination Item	Performed	Adequate Technique
1 Observation		
Exposure	0 1 2	Observe as they describe for discomfort
General posterior observation	0 1 2	Symmetry, scars, lesions, atrophy
Scapular winging/dyskinesia	0 1 2	Patient raises arms bilaterally, well press
2 Palpation		
Sternoclavicular joints	0 1 2	
Acromioclavicular joints	0 1 2	
Biceps tendons	0 1 2	
Subacromial space	0 1 2	Lateral and posterolateral
3 Range of Motion (ROM)		
Motor Function of Rotator Cuff		
4 Scapulothoracic		
ROM: Active abduction in scapular plane	0 1 2	Scapular plane, neutral rotation
Painful arc (<90°)		Allow for full active abduction
Drop arm test		
Motor: Empty Can Test	0 1 2	Scapular plane, full pronation
		Resisted abduction lower than 90°
Infraclavicular		
ROM: Active external rotation	0 1 2	Elbows at side
Motor: Active external rotation against resistance	0 1 2	Elbows at side
		Start with hands near midline
Subglavicular		
Unilateral		
Motor: Belly Press Test	0 1 2	Hand on abdomen, elbow anterior to midline
		Examiner pulls at forearm
ROM: Active internal rotation along spine	0 1 2	Watch for elbow to drop
		Observe patient from behind
Motor: Lift Off Test	0 1 2	Hand at lumbar spine
		Actively lifts arm off back, resistance at wrist
Triceps/Elbow		
ROM: Active external rotation with 90° shoulder abduction and 90° elbow flexion	0 1 2	90° shoulder abduction & 90° elbow flexion
Motor: Hornblower's Test	0 1 2	Active external rotation
		External rotation as above against resistance
<i>Note: Check passive ROM if active is limited. This will help identify a mechanical block versus weakness or pain</i>		
5 Provocative Testing		
Impingement Testing		
Hawkin's Test	0 1 2	Shoulder 90° abduction in scapular plane
		90° elbow flexion, internal rotation + horizontal adduction
Neer's Test	0 1 2	Elbow extended, arm in full pronation
		Maximal passive forward elevation of shoulder with scapular stabilization
Biceps Testing		
Speed's Test	0 1 2	Hand in supination
		40° forward elevation, 20-30° elbow flexion
Yergason's Test	0 1 2	Apply downward pressure to forearm
		Elbow at side, 90° flexion; palm in supination
		Resisted supination
Acromioclavicular Joint Testing		
Cross-arm Test	0 1 2	Active horizontal abduction

Scoring: 0 = Item not performed. 1 = Item performed but technique not adequate. 2 = Item performed correctly.

The authors would like to acknowledge Michael J. Battistone, MD, Andrea M. Barker, PA-C, and the Salt Lake City, UT Veterans Administration for their support in this project through mentorship and by granting permission to utilize and adapt their educational materials for our project. Furthermore, the authors would like to acknowledge our DNP Project Mentors: Janice K. Williams, DNP, MSN, FNP-C, and Shara Fisher, DNP, FNP-C, MAJ (P), AN for their support, guidance, and assistance. Their time, effort, and dedication to this project is appreciated more than words can express.

The views expressed in this poster are those of the authors and do not necessarily reflect the official policy or position of the Uniformed Services University of the Health Sciences, the Department of Defense, Carl R. Darnall Army Medical Center, or the United States government.

By improving the Physical Exam Skills of Primary Care providers, our project supports the DHA quadruple aim goals

- Better care, as PCPs demonstrated both subjective and objective improvement of their Shoulder exam skills
- Better health, this is likely to lead to improved time to accurate diagnosis, which then leads to patient receiving the most appropriate treatment faster
- Lower costs, may be achieved as not all shoulder injuries require diagnostic imaging
- With improved exam skills the probability of inappropriate imaging orders is likely reduced
- Increased readiness, as shoulders receiving more timely appropriate treatment are likely to have an improved injury recovery rate timelines.



DOCTOR OF NURSING PRACTICE PROJECT
DNP Project Clinical Question and Team Mentor (Committee Membership) Agreement Form

Graduation Year: 2023

Name(s) of DNP Project Student Team:

- 1. MAJ Justin Kimmel Phase II Site: AGCNS FNP PMHNP RNA WHNP
- 2. CPT LeeAnna Moore Phase II Site: AGCNS FNP PMHNP RNA WHNP
- 3. _____ Phase II Site: AGCNS FNP PMHNP RNA WHNP
- 4. _____ Phase II Site: AGCNS FNP PMHNP RNA WHNP
- 5. _____ Phase II Site: AGCNS FNP PMHNP RNA WHNP
- 6. _____ Phase II Site: AGCNS FNP PMHNP RNA WHNP

The tentative title of the DNP Project Proposal for this student group is:

Improving the shoulder physical examination skills for primary care providers caring for active duty patients

Committee Approved DNP Project Clinical Question:

For primary care providers serving active-duty service members, does a two day intensive shoulder workshop,
compared to previous practice increase provider confidence and accuracy of assessment in the diagnosis of shoulder pain?
_____?

Names of DNP Project Team Mentors (*type the name and obtain signatures*):

I agree to serve as a member of the DNP Project Team (Team Mentors) for the above DNP Student Project Team. As a Project Team Mentor, I agree to the duties and responsibilities outlined within the DNP Project Manual which include but are not limited to the provision of consultation and guidance supporting the entire DNP project journey and to ensure the DNP project is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation.



Appendix C:

Daniel K. Inouye Graduate School of Nursing
DNP Project Team Mentor (Committee Membership) Agreement Form

NOTE: *You may have 3-4 DNP Team Mentors [committee members including your DNP Senior Mentor (Chair)]. The Phase II Site Director may also be a member of the group, as well as other USUHS faculty or others who may serve as content experts. All non-USUHS faculty selected as a Team Mentor must be approved by the DNP Project Director.*

Senior Mentor (Chair): Williams, Janice Signature: WILLIAMS.JANIC
E.K.1550640275 Digitally signed by
WILLIAMS.JANICE.K.1550640275
Date: 2022.07.18 11:19:18 -0400' Date: 18July22

Team Mentor (Committee): Fisher, Shara Signature: _____ Date: _____

Team Mentor (Committee): _____ Signature: _____ Date: _____

Team Mentor (Committee): _____ Signature: _____ Date: _____