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TITLE: Comparative Effectiveness of Acupuncture for Chronic Pain and Co-morbid Conditions in Veterans

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**14. ABSTRACT**

Building on identified scientific gaps in the literature and our promising preliminary data, we will conduct a randomized controlled trial (RCT) of Electro-acupuncture (EA) vs. Battle Field Acupuncture (BFA) vs. Waitlist Control usual care (WLC) on 360 patients with chronic musculoskeletal pain. We will also examine the effects of baseline outcome expectancy and genetic polymorphisms on pain reduction. The overarching goal of the Personalized Electro-acupuncture vs. Auricular-acupuncture Comparative Effectiveness (PEACE) trial is to investigate EA and BFA (a form of auricular acupuncture) to guide the personalized delivery of treatment to improve pain and co-morbid symptoms. To achieve the overarching goal, the specific aims are:

Specific Aim 1: To compare the effects of Electro-acupuncture (EA) vs. Battle Field Acupuncture (BFA) vs. Waitlist Control usual care (WLC) on patient-reported pain (primary outcome), physical functions, and co-morbid symptoms [fatigue, sleep disturbance, anxiety, depression, and post-traumatic stress disorder (PTSD)] among patients experiencing chronic musculoskeletal pain for three months or greater.

Specific Aim 2: To determine the interaction between outcome expectancy and type of needling delivery (EA vs. BFA) on pain reduction.

Specific Aim 3: To evaluate the association between specific genetic polymorphisms and patients' responses to acupuncture.

**15. SUBJECT TERMS**
Acupuncture; Electro-Acupuncture; Auricular-Acupuncture; Clinical Trial; Pain; Musculoskeletal Pain; Chronic Pain; Sleep Disturbance; Fatigue; Anxiety; Depression; Post-traumatic Stress Disorder; Physical Functioning; Genetics; Expectancy; Comparative Effectiveness

| **16. SECURITY CLASSIFICATION OF:** | | | **17. LIMITATION OF ABSTRACT** | **18. NUMBER OF PAGES** | **19a. NAME OF RESPONSIBLE PERSON** |
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## 1. INTRODUCTION:

Building on identified scientific gaps in the literature and our promising preliminary data, we will conduct a randomized controlled trial (RCT) of Electro-acupuncture (EA) vs. Battle Field Acupuncture (BFA) vs. Waitlist Control usual care (WLC) on 360 patients with chronic musculoskeletal pain. We will also examine the effects of baseline outcome expectancy and genetic polymorphisms on pain reduction. The overarching goal of the Personalized Electro-acupuncture vs. Auricular-acupuncture Comparative Effectiveness (PEACE) trial is to investigate EA and BFA (a form of auricular acupuncture) to guide the personalized delivery of treatment to improve pain and co-morbid symptoms.

## 2. KEYWORDS:

- Acupuncture
- Electro-Acupuncture
- Auricular-Acupuncture
- Clinical Trial
- Pain
- Musculoskeletal Pain
- Chronic Pain
- Sleep Disturbance
- Fatigue
- Anxiety
- Depression
- Post-traumatic Stress Disorder
- Physical Functioning
- Genetics
- Expectancy
- Comparative Effectiveness

## 3. ACCOMPLISHMENTS:

**What were the major goals of the project?**

To achieve the overarching goal described above, the specific aims are:

**Specific Aim 1:** To compare the effects of Electro-acupuncture (EA) vs. Battle Field Acupuncture (BFA) vs. Waitlist Control usual care (WLC) on patient-reported pain (primary outcome), physical functions, and co-morbid symptoms [fatigue, sleep disturbance, anxiety, depression, and post-traumatic stress disorder (PTSD)] among patients experiencing chronic musculoskeletal pain for three months or greater.

**Specific Aim 2:** To determine the interaction between outcome expectancy and type of needling delivery (EA vs. BFA) on pain reduction.

**Specific Aim 3:** To evaluate the association between specific genetic polymorphisms and patients' responses to acupuncture.

**Table I. Work Plan to Accomplish Specific Aims 1, 2, & 3:**

| | Timeline from Award Date 9/15/2016 (Months) | Completion Progress as of 10/14/2016 |
|---|---|---|
| **Major Task 1: Plan & Prepare** | **1-6** | **In Progress** |
| Review and confirm protocol and procedure, incorporating input from co-investigators | 1 | Done |
| Submit & obtain Approval from IRB at MSKCC | 2-4 | In Progress |
| Submit & obtain Approval from HRPO | 4-6 | |
| Submit amendments, adverse events and protocol deviations as needed | As Needed | |
| Build procedure for annual IRB report (continuing review) | 2 | In Progress |
| Hire Staff as needed | 1-3 | In Progress |
| Train Staff as needed | 2-4 | In Progress |
| Develop database | 2-4 | In Progress |
| Pilot data collection with staff to ensure success | 4-6 | |
| Pilot recruitment process with staff to ensure success | 4-6 | |
| **Major Task 2: Launch Study** | **7** | |
| Coordinate with facilities to kickoff recruitment | 7 | |
| **Major Task 3: Conduct Trial** | **7-54** | |
| Enroll subjects (40 patients) and randomly distribute patients between EA, BFA, & WLC – perform designated treatment, collecting data as needed | 7-12 | |
| Enroll subjects (120 patients) and randomly distribute patients between EA, BFA, & WLC – perform designated treatment, collecting data as needed | 13-24 | |
| Enroll subjects (140 patients) and randomly distribute patients between EA, BFA, & WLC – perform designated treatment, collecting data as needed | 25-36 | |
| Enroll subjects (62 patients) and randomly distribute patients between EA, BFA, & WLC – perform designated treatment, collecting data as needed | 37-42 | |
| Extract necessary data from bio-samples and catalogue in the database | 7-42 | |
| Perform ongoing data entry and data verification – preemptively managing missing data | 7-42 | |
| Follow up with subjects at defined intervals to collect surveys and understand delayed effects of treatment | 10-45 | |
| Expand to recruitment regional network sites in New Jersey or New York affiliated with MSK if necessary to meet recruitment milestones | As Needed | |
| **Major Task 4: Conduct Analysis** | **12-48** | |
| Genotype DNA extracted from patients to address Specific | 36-48 | |

| | | |
|---|---|---|
| Aim 3 | | |
| Complete all analyses according to specifications, share output and finding with all investigators | 36-48 | |
| Write manuscript based on findings, prepare for submission to peer- reviewed clinical trial journal | 12-48 | |
| **Major Task 5: Share Results** | **48+** | |
| Submit to peer-reviewed clinical trial journal | | |
| Present Interim & final findings at DOD Conference | | |

**What was accomplished under these goals?**

- In December 2015, Dr. Jun J. Mao (PI) transitioned his faculty appointment from the University of Pennsylvania (U Penn) to Memorial Sloan Kettering Cancer Center (MSK). As a result, Dr. Mao has worked with DoD administrative officials to transfer the grant from U Penn to MSK during this past year. The updated project start date was moved from 9/30/2015 to 9/15/2016.
- During this past year, the project protocol has been updated to reflect the transfer of the grant project to MSK. After detailed conversations with DoD officials, it was approved to recruit patients from MSK. The updated project protocol is currently under review by the MSK IRB committees.
- We have interviewed and hired a post-doctoral researcher to work on the project.
- To date, we are on track with accomplishing our stated goals outlined in Table 1.

**What opportunities for training and professional development has the project provided?**

- Sally A. D. Romero is our newly hired post-doctoral research; she has a PhD in Public Health with an emphasis in Health Behavior. She is currently taking a 6-week Genomics workshop hosted through Cornell University to gain a better understanding of contemporary genomics technologies and their applications in the biomedical field to apply to the project's Specific Aim 3. Throughout this next year, she plans to attend relevant seminars, workshops and conferences related to the goals of the project.

**How were the results disseminated to communities of interest?**

- Nothing to report.

**What do you plan to do during the next reporting period to accomplish the goals?**

- During this next year, we will continue to accomplish the major tasks outlined in Table 1.
- We will plan and prepare the project (Major Task 1) including but not limited to the following tasks:
    - Receiving approval from MSK's IRB committees should be completed by November 2016.
    - Obtaining approval from HRPO will start as soon as we have received IRB approval from MSK (November 2016).
    - Hiring and training staff has started and will be completed by January 2017.
    - Piloting project procedures and recruitment with study staff will begin in January 2017. This will be done to ensure all data collection and recruitment procedures run smoothly prior to the official launch of the study.

- Once the above planning/preparing tasks are completed, we will be ready to launch the study (Major Task 2) in early spring 2017.
- Next, we will start recruitment and conduct the trial (Major Task 3). We plan to have recruited and randomized a minimum of 40 MSK patients to the RCT by September 2017.

## 4. IMPACT:

**What was the impact on the development of the principal discipline(s) of the project?**

- Nothing to report.

**What was the impact on other disciplines?**

- Nothing to report.

**What was the impact on technology transfer?**

- Nothing to report.

**What was the impact on society beyond science and technology?**

- Nothing to report.

## 5. CHANGES/PROBLEMS:

**Changes in approach and reasons for change**

- As stated above, Dr. Mao (PI) has transitioned from U Penn to MSK and has successfully transferred the grant to MSK. The updated project start date was moved from 9/30/2015 to 9/15/2016.

**Actual or anticipated problems or delays and actions or plans to resolve them**

- Nothing to report.

**Changes that had a significant impact on expenditures**

- Nothing to report.

**Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents**

- **Significant changes in use or care of human subjects:** Nothing to report.
- **Significant changes in use or care of vertebrate animals:** Not applicable.
- **Significant changes in use of biohazards and/or select agents:** Not applicable.

## 6. PRODUCTS:

- **Publications, conference papers, and presentations:** Nothing to report.
- **Journal publications:** Nothing to report.
- **Books or other non-periodical, one-time publications:** Nothing to report.
- **Other publications, conference papers, and presentations:** Nothing to report.
- **Website(s) or other Internet site(s)***:* Nothing to report.

- **Technologies or techniques**: Nothing to report.
- **Inventions, patent applications, and/or licenses**: Nothing to report.
- **Other Products**: Nothing to report.

## 7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

**What individuals have worked on the project?**

| | |
|---|---|
| Name: | Jun J. Mao |
| Project Role: | PI |
| Researcher Identifier (e.g. ORCID ID): | ORCID ID: 0000-0001-9229-0380 |
| Nearest person month worked: | 1 |
| Contribution to Project: | Dr. Mao has worked with DoD administrative officials to have the grant transferred from the University of Pennsylvania to Memorial Sloan Kettering Cancer Center.<br><br>Dr. Mao has written and developed the protocol submitted to the MSK IRB committees. Additionally, he has responded to clarification questions posed by the MSK IRB committees as it moves through the approval process. |
| Funding Support: | DoD |

**Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?**

- Nothing to report.

**What other organizations were involved as partners?**

- Nothing to report.

## 8. SPECIAL REPORTING REQUIREMENTS

- **COLLABORATIVE AWARDS:** Not applicable.
- **QUAD CHARTS:** Not applicable.

## 9. APPENDICES: None.