DEFENSE HEALTH AGENCY
MADIGAN ARMY MEDICAL CENTER
9040 JACKSON AVENUE
TACOMA, WASHINGTON 98431-1100

MCHJ-MOE-C 10 August 2023

MEMORANDUM FOR LTC Jeremy Schroeder, Principal Investigator at Madigan Army Medical Center

SUBJECT: Madigan Army Medical Center Institutional Review Board Review Approval of Continuation for Protocol "Photobiomodulation Therapy for Plantar Fasciitis: A Single-Blind Randomized Control Trial" Protocol #222072

1. At the convened meeting of 10 August 2023, the Madigan Institutional Review Board (IRB) considered the above-referenced research. The purpose of this memorandum is to inform you of the actions taken by the Board.

2. In accordance with 32 CFR 219.111, this study was approved to continue from 10 August 2023 through 09 August 2024.

3. The IRB approved consent form with embedded HIPAA has been stamped in EIRB. It is your responsibility to log into EIRB and print this version of your consent form for use during the consent process; the stamp is found on the last page (stamped Approved 10 August 2023; Expiration 09 August 2024). This consent form is being issued in conjunction with Modification 5.0 which was also reviewed at this IRB meeting.

4. As a reminder, submission of a continuing review report for this protocol is your responsibility and is due 60 days prior to your IRB expiration date. EIRB will attempt to send you continuing review reminders at 90, 60, 30, 14 and 1 day prior to your expiration date. Failure to submit the report on time will result in expiration of the IRB approval for your protocol and a requirement to cease all use.

5. Unanticipated problems involving risk to subjects or others and all serious adverse events must be promptly reported to the Madigan IRB within 3 business days by telephone 253-968-0149 or by email sandra.l.smith399.civ@health.mil. A complete written report should be submitted in EIRB using the Reportable Event Form following the initial notification.

6. Any changes to your protocol, including any changes in study personnel, may not be made without prior IRB approval. A Modification form with the changes and the rationale should be submitted in EIRB to the Madigan IRB for review and approval.

7. Please be sure to maintain all of your protocol records in accordance with the terms set forth in your protocol. You are required to have all records, including consent forms and HIPAA documents available for review by the IRB or other federal agencies.

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8. In accordance with the IRB Standard Operating Procedures, you may address the IRB in person or in writing regarding this action. Please contact the Madigan IRB at 253-968-0149, for additional information, or if you have any questions regarding the IRB’s actions.

Signature applied by Walter James Sowden on 08/16/2023 04:52:18 PM CDT

WALTER J. SOWDEN, PhD
LTC, MS
Chair, Institutional Review Board
Madigan Army Medical Center

EIRB Protocol Template (Version 1.13)

1.0 General Information

***Please enter the full title of your study:**

Photobiomodulation Therapy for Plantar Fasciitis: A Single-Blind Randomized Control Trial

***Please enter the Protocol Number you would like to use to reference the protocol:**

Photomedicine Project 8: Photobiomodulation Therapy for Plantar Fasciitis
* This field allows you to enter an abbreviated version of the Protocol Title to quickly identify this protocol.

Is this a multi-site study (i.e. Each site has their own Principal Investigator)?

Yes

Does this protocol involve the use of animals?

○ Yes ◉ No

2.0 Add Site(s)

2.1 List sites associated with this study:

Primary Dept?	Department Name
◆	**P and R** - Madigan Army Medical Center (MAMC)

3.0 Assign project personnel access to the project

3.1 *Please add a Principal Investigator for the study:

Schroeder, Jeremy Daniel, DO LTC

Select if applicable

☐ Student ☐ Site Chair
☐ Resident ☐ Fellow

3.2 If applicable, please select the Research Staff personnel:

A) Additional Investigators

HAGER, NELSON ALLEN
Associate Investigator
Stormer, Jonathan David
Associate Investigator

B) Research Support Staff

Carper, Moriah C
Non-engaged Administrator
Cin, Honey Lal Sui
Research Coordinator
Karikari, Nana-King Ahwoi
Team Member
Lucio, Whitley B
Non-engaged Administrator
MCKEE, Samantha Jade
Non-engaged Administrator
Metzger, Elizabeth C
Research Coordinator
Mincey, Carla T
Research Coordinator
Ory, Rian Lyndzie, MS
Non-engaged Administrator
Persinger, John Edward
Team Member
Rossi, Robert M, MPH
Research Coordinator

3.3 *Please add a Protocol Contact:

Carper, Moriah C
Cin, Honey Lal Sui
HAGER, NELSON ALLEN
Karikari, Nana-King Ahwoi
MCKEE, Samantha Jade
Metzger, Elizabeth C
Mincey, Carla T
Ory, Rian Lyndzie, MS
Rimmert, Bradley Reay, DO MAJ
Rossi, Robert M, MPH
Schroeder, Jeremy Daniel, DO LTC
Stormer, Jonathan David

The Protocol Contact(s) will receive all important system notifications along with the Principal Investigator. (i.e. The protocol contact(s) are typically either the Protocol Coordinator or the Principal Investigator themselves).

3.4 If applicable, please select the Designated Site Approval(s):

Add the name of the individual authorized to approve and sign off on this protocol from your Site (e.g. the Site Chair).

4.0 Project Information

4.1 * What department(s) will be associated with this protocol?

	Podiatry
	Family Medicine

4.2 * Is the IRB of record for this study an IRB/HRPP that does NOT use EIRB? If Yes, complete the application according to the IRB/HRPP Determination.

If your Projects or Protocols are under the oversight of another IRB that does use EIRB, stop this submission and contact the core site and request an invitation as a performing site.

If your Project or Protocol is now being submitted for the first time to an IRB that does use EIRB, continue with this application and answer the questions to be reviewed by the IRB.

Answering yes means the board of record is an IRB that does NOT use EIRB.

○ Yes ◉ No

4.3 * Is this protocol research, expanded access, or humanitarian use device?

◉ Yes ○ No

4.4 * What type of protocol is this?

- ☐ Behavioral Research
- ☑ Biomedical Research
- ☑ Clinical trial (FDA regulated)
- ☐ Educational Research
- ☐ Expanded Access
- ☐ Humanitarian Use Device (HUD)
- ☐ Psychosocial Research
- ☐ Oral History
- ☐ Other

4.5 Are you conducting this project in pursuit of a personal degree?

○ Yes ◉ No

4.7 * Is this human subjects research? (As defined by 32 CFR 219) Human subject means a living individual about whom an investigator (whether professional or student) conducting research:
(i) Obtains information or biospecimens through intervention or interaction with the individual, and uses, studies, or analyzes the information or biospecimens; or
(ii) Obtains, uses, studies, analyzes or generates identifiable private information or identifiable biospecimens.

◉ Yes ○ No

4.8 * Do you believe this human subjects research is exempt from IRB review?

○ Yes ◉ No

5.0

Personnel Details

5.1 Does the Principal Investigator have a Permanent Change of Station (PCS) Date or Estimated Institutional Departure Date (EIDD)?

○ Yes ◉ No

5.2 List any Research Team members without EIRB access that are not previously entered in the protocol:

No records have been added

5.3 Are any Contractors or Subcontractors involved in this study? If yes, please list them and describe their role.

◉ Yes ○ No

Name: (Last, First, M.I.)	Phone Number:	Email Address:	Associated Institution:
Cin, Honey Role on Protocol: Research Coordinator	425-761-5507	hcin@genevausa.org	The Geneva Foundation / MAMC
Gabler, Geoffrey Role on Protocol: Research Physical Therapist	360-269-3443	ggabler@genevausa.org	The Geneva Foundation / MAMC
Karikari, Nana-king Role on Protocol: Research Assistant	253-228-7347	nkarikari@genevausa.org	The Geneva Foundation / MAMC
Samantha McKee Role on Protocol: Research Assistant II	229-412-4567	smckee@genevausa.org	The Geneva Foundation / MAMC
Name: (Last, First, M.I.)			

Persinger, John Role on Protocol: Associate Investigator and Clinical Laser Safety Officer (CLSO)	Phone Number: 253-350-5075	Email Address: jpersinger@genevausa.org	Associated Institution: The Geneva Foundation / MAMC
Name: (Last, First, M.I.) Hager, Nelson Role on Protocol: Assocaite Investigator	Phone Number: 425-218-1833	Email Address: nelson.hager.ctr@usuhs.edu	Associated Institution: The Geneva Foundation / MAMC
Name: (Last, First, M.I.) Mincey, Carla Role on Protocol: Research Coordinator	Phone Number:	Email Address: 425-218-1833	Associated Institution: The Geneva Foundation / MAMC
Name: (Last, First, M.I.) Rossi, Robert Role on Protocol: Research Coordinator	Phone Number: 425-218-1833	Email Address: 425-218-1833	Associated Institution: The Geneva Foundation / MAMC
Name: (Last, First, M.I.) Ory, Rian L Role on Protocol: MIRROR Regulatory Affairs Manager	Phone Number: 909-904-5034	Email Address: rian.ory.ctr@usuhs.edu	Associated Institution: The Geneva Foundation / USUHS
Name: (Last, First, M.I.) Lucio, Whitley B Role on Protocol: MIRROR Sr. Regulatory Affairs & Data Manager	Phone Number: 202-375-8831	Email Address: whitley.lucio.ctr@usuhs.edu	Associated Institution: The Geneva Foundation / USUHS

Name: (Last, First, M.I.)	Phone Number:	Email Address:	Associated Institution:
Metzger, Elizabeth C Role on Protocol: Photomedicine Scientiifc Program Manager	252-562-2419	emetzger@genevausa.org	The Geneva Foundation / USUHS
Name: (Last, First, M.I.) Carper, Moriah Role on Protocol: MIRROR Regulatory Affairs Coordinator	Phone Number: 540-267-6654	Email Address: moriah.carper.ctr@usuhs.edu	Associated Institution: The Geneva Foundation / USUHS

5.4 Will you have a Research Monitor for this study?

- ○ Yes
- ◉ No
- ○ N/A

6.0 Data/Specimens

6.1 Does the study involve the use of existing data or specimens only (no interaction with human subjects)?

○ Yes ◉ No

7.0 Funding and Disclosures

7.1 Source of Funding:

Funding Source	Funding Type	Amount
: Other USUHS Award Number HU00011920011	: Research Development Testing and Evaluation (RDT&E) funds MIRROR - Photomedicine	153303

Total amount of funding:

153303

7.2 Do you or any other Investigator(s) have a disclosure of a personal interest or financial nature significant with sponsor(s), product(s), instrument(s) and/or company(ies) involved in this study?

○ Yes ◉ No

All personnel engaged in research must complete and attach a Conflict of Interest (COI) form.

8.0 Study Locations

8.1 Is this a collaborative or multi-site study? (e.g., are there any other institutions involved?)

◉ Yes ○ No

8.2 Study Facilities and Locations:

Institution	Site Name	Site Role	FWA or DoD Assurance Number	Assurance Expiration Date	Is there an agreement?	IRB Reviewing for Site
Army	MAMC	Lead site	FWA00003277	09/17/2026		: RHC - P IRB
P&R	USUHS	Coordinating center	FWA00001628	05/04/2026	: IAIR	: RHC - P IRB

Other:

Other Institution Site	Site Role	FWA or DoD Assurance Number	FWA or DoD Expiration Date	Is there an agreement?	IRB Reviewing for Site
No records have been added					

8.3 Are there international sites?

Attach international approval documents, if applicable, when prompted. Note: Ensure local research context has been considered

○ Yes ◉ No

8.4 Is this an OCONUS (Outside Continental United States) study?

○ Yes ◉ No

Select the area of responsibility:

Have you obtained permission from that area of responsibility? (This is a requirement prior to study approval)

○ Yes ○ No

9.0 Study Details

9.1 Key Words:

Provide up to 5 key words that identify the broad topic(s) of your study

Plantar Fasciitis, Photobiomodulation Therapy, Tendinopathy, Low Level Laser Therapy

9.2 Background and Significance:

Include a literature review that describes in detail the rationale for conducting the study. Include descriptions of any preliminary studies and findings that led to the development of the protocol. The background section should clearly support the choice of study variables and explain the basis for the research questions and/or study hypotheses. This section establishes the relevance of the study and explains the applicability of its findings

Plantar fasciitis (PF), a degenerative disease of the connective tissue supporting the foot, is the number one cause of heel pain in ambulatory settings, affecting up to 10% of adults. Military service members may have increased risk of developing PF due to extrinsic factors such as intense and frequent physical training, poor biomechanics, repetitive impact on hard surfaces, poor footwear, and prolonged weight bearing of combat loads.[5, 6] A prevalence study conducted in an Infantry Brigade Combat Team while deployed to Afghanistan reported that PF was one of the top five diagnosed musculoskeletal injuries seen by physical therapists during their deployment.[7] Scher and colleagues conducted an analysis using the Defense Medical Epidemiology Database and reported the incidence of PF in active duty service members to be 10.5 per 1000 person-years.[1] Roy and colleagues reported that while deployed to Afghanistan, Soldiers who carried heavier loads were at increased risk for all musculoskeletal injuries.[8] Despite limited reporting of PF, it is known that musculoskeletal injuries are leading causes of disability discharge, nonbattle evacuations from theater, and result in lost duty time and decreased readiness.[9]

Though the name is misleading, PF is not primarily an inflammatory condition. An acute inflammatory process occurs in response to repetitive trauma to the connective tissue; however, the result is tissue destruction, leading to chronic fibrosis. Histological analysis of plantar fascia and adjacent muscle from individuals with heel pain demonstrated fascial thickening, collagen necrosis, matric calcification, perifascial edema, and alterations in vascularization. Conservative PF treatment, though effective in a majority of cases, generally takes six months to a year, and improvements are often not seen until after six to eight weeks of therapy.[2, 3, 5] Even in cases where conservative therapy is beneficial, continuing pain and decreased function limits physical activity. Physical activity limitations in Active Duty Service members may have negative consequences at both the individual and unit level.[16] In some resistant cases, more aggressive, painful, and invasive treatments are recommended, such as corticosteroid injections, radiation,[17] platelet-rich plasma injections,[12] and even surgery.[2, 3, 18] Innovative, safe, non-invasive therapies are needed that can address the root cause of the injury, decrease the pain of PF quickly, and return individuals to increased function and physical activity without the use of chronic pain medication use and expensive treatments.

Photobiomodulation therapy (PBMT) is defined as “a form of light therapy that utilized non-ionizing forms of light sources, including lasers, light-emitting diodes (LEDs), and broadband light, in the visible and infrared spectrum …involving endogenous chromophores eliciting photophysical and photochemical events at various biological scales. This process results in beneficial therapeutic outcomes, including, but not limited to, the alleviation of pain or inflammation, immunomodulation, and promotion of wound healing and tissue regeneration.”[1] Photobiomodulation (PBM) is used therapeutically to reduce inflammation, reduce edema, treat chronic joint disorders and treat pain. PBM has shown efficacy in decreasing pain and improving function in painful conditions such as carpal tunnel syndrome, arthritis, and acute and chronic neck pain. Several studies using PBMT to treat tendinopathies (lateral epicondylitis, shoulder tendinopathy, and Achilles tendinopathy) have demonstrated a positive effect when using optimized wavelengths and dosing parameters. The success of PBMT in treating painful tendinopathies may be contributed to the effect on collagen production. In a rabbit model of Achilles tendon injury, PBMT enhanced healing of the tendon by increasing collagen production, suggesting that PBM accelerated healing and improved mechanical integrity of the tendon. PBMT has also been shown to improve alignment of collagen fibers, an essential step in regeneration of injured tissue. Yet another study demonstrated that rats with an Achilles tendon injury that were subjected to PBMT along with exercise had great tensile strength of their injured tendon compared to animals with either exercise or PBMT alone.[2]

Despite positive results in some tendinopathy studies, a lack of consistent application of dosing parameters and study methodology make it difficult for systematic reviews and meta-analyses to conclude that PBMT is of benefit. However, our team recently completed a pilot study in an active duty military and civilian population which demonstrated a positive effect of two PBM dose parameters on function and pain levels in participants with chronic PF when combined with stretching and ice. Participants were randomly assigned to one of three groups: usual care (UC) (daily stretching and cryotherapy), UC plus PBM lower dose (10W), or UC plus PBM higher dose

(25W) groups (n = 38 in each group). The treatment protocol 10W and 25W groups consisted of nine total treatments (three per week for three weeks) performed with the LightForce EXP diode laser (LiteCure, LLC); 20% 810 nm/80% 980 nm continuous wave. As with any treatment, choosing the correct dose is essential to optimizing safety and efficacy.[22] Of the multiple parameters for PBMT, wavelength and power are likely the most important, as wavelength determines the depth of photon penetration and power determines the number of photons delivered to the target tissue. PBM in the 810-980 nm wavelength range is known to penetrate the skin and superficial tissues to reach underlying tissues, such as muscle and tendon, including the target tissue of the plantar fascia.[23] A treatment irradiance of 10K/cm^2 was chosen based on positive outcomes using PBMT with a similar devices in Achilles tendinopathy.[35]

We calculated the area of the plantar surface of the foot and dorsal aspect of the calf; then delivered 10J/cm^2 per treatment; therefore, time and total energy differed depending on group and total area treated, but total 'dose' of light remained constant over the area. The treatment was delivered with the participant laying prone, with the massage ball in contact with their skin in a serpentine motion for the duration of the treatment. The practitioners delivered half of the treatment to the foot and half to the calf, performing passive range of motion of the foot and ankle intermittently throughout the treatment. The treatment was well-tolerated and adhered to by all participants.

There were no differences observed between members of the 10W and 25W treatment groups, however, both treatment groups reported statistically and clinically significant improved foot and ankle function and decreased levels of pain compared to control group participants who only completed stretching exercises and cryotherapy (unpublished data). Additionally, both treatment groups sustained improved function (FAAM Sports Subscale) and decreased pain at the 6-month follow-up after receiving treatment. Control group participants were withdrawn at the 6-week mark, so they were not included in 6-month follow-up for comparison.

The positive findings from the aforementioned study are promising in the treatment of this common and debilitating issue. Achieving positive outcomes in this short period of time (3 weeks, 9 treatments total), which last for at least 6 months is preferential to standard conservative treatment for PF, which typically lasts 6-12 months, requiring multiple visits per month to primary care, physical therapy and/or podiatry.

With this follow-on study, we propose to rigorously reduce any potential placebo effect of the treatment protocol by adding a sham + UC comparison group, instead of UC alone. Adding the sham comparison will ensure that all participants receive the same number of interactions with the study team without adding any risk to those randomized to the control group.[36] Since both the 10W and 25W treatment parameters achieved similar outcomes, we propose further refining the treatment protocol and reducing treatment time by using the 25W treatment parameters. Lastly, we are adding an objective outcome measure to strengthen the impact of this study.

9.3 Objectives/Specific Aims/Research Questions:

Describe the purpose and objective(s) of the study, specific aims, and/or research questions /hypotheses

Specific Aim #1: To assess the clinical effectiveness of photobiomodulation compared to sham photobiomodulation to improve function and decrease pain.

Specific Aim #2: To evaluate the effectiveness of photobiomodulation compared to sham photobiomodulation to resolve plantar fascial thickening.

The *general hypothesis* is that PBMT will be clinically effective for the treatment of PF compared to sham photobiomodulation and result in resolution of fascial thickening, decrease in pain, and improved function. In order to eliminate any potential placebo effect from participants in the treatment group receiving therapy vs. those in the UC alone group, we propose to compare PBMT+UC to Sham PBMT+UC.

This hypothesis will be tested by comparing outcomes on pain and function between PBMT+UC and Sham PBMT+UC. Based on pilot data, 25W laser will be used to deliver 10J/cm^2, calculated in the same manner as in the pilot study. The effectiveness of the PBM will be measured by the standardized FAAM sports subscale for function and DVPRS for pain outcomes. Fascial thickening will be measured by ultrasound.

9.4 Study Design:

Describe study design in one to two sentences (e.g., prospective, use of existing records/data /specimens, observational, cross-sectional, interventional, randomized, placebo-controlled, cohort, etc.). Specify the phase – Phase I, II, III, or IV – for FDA-regulated investigational drug research

We will use a prospective randomized sham-controlled trial to meet the aims of this study.

9.5 Target Population:

Describe the population to whom the study findings will be generalized

The findings from this study can be applied to the healthy, active duty adult population and can be translated to civilian athletes as well.

9.6 Benefit to the DoD:

State how this study will impact or be of benefit to the Department of Defense

In the U.S. Military, musculoskeletal injuries, including tendinopathies, are responsible for 5 to 10 times more lost training days than illness, and injury-related disability costs the military $750 million annually. Plantar fasciitis is one of the contributors to the disability cost. Physical activity-limiting conditions are incompatible with maintaining a fit and ready force and improving the health of those entrusted to our care. This innovative therapy has tremendous potential to provide the best possible outcomes for both military members and their families by optimizing their overall health by allowing them to enhance their physical activity free from pain.

This study will produce new scientific knowledge about the optimal dosing parameters of PBMT to best reduce pain and improve function for those entrusted to our care who are limited by PF. The long term goals of this research team include developing PBMT protocols for broad application to other painful and duty-limiting conditions, and exploring the application of this portable device in forward-deployed environments. This innovative therapy has the potential to promote a fit and ready force by returning service members to duty quickly, reducing health care costs, and promoting operational readiness.

10.0 Study Procedures, Data Management, and Privacy

10.1 Study Procedures:

Describe step-by-step how the study will be conducted from beginning to end

Recruitment, Pre-Screening (before consent), Study Introduction & Informed Consent: Potential participants will be identified via four methods:

1. Under the provisions of the Partial HIPAA Waiver, the local study team will review medical records of patients coming in to the Orthopaedic and Podiatry Clinics for suspected plantar fasciitis to identify prospective research participants for the purposes of seeking their authorization to participate/use their protected health information for this research study. In these cases, the study team will receive approval from the potential participant's provider prior to approaching for possible study participation.
2. Direct referral from local healthcare providers in the local Family Medicine, Podiatry, Physical Therapy, and Physical Medicine & Rehabilitation (PM&R) clinics.
3. Patients may self-refer to participate in the study. Interested potential participants will be able to contact a member of the study team via phone or email. Potential participants who contact the study team directly will be instructed to access the Physical Therapy clinic or their primary care manager for a physical exam and diagnosis of Plantar Fasciitis (PF), or confirmation of a previous PF diagnosis.
4. Study advertisements will be posted within the following locations, and copies will be provided to clinic staff:
    a. Internal Medicine
    b. Aviation Medicine
    c. McChord Clinic
    d. Winder Clinic

e. Okubo SCMH
f. Allen Soldier -Center Medical Home
g. SRU
h. Puyallup Community Medical Home
i. South Sound Community Medical Home
j. Armed Forces Wellness Center
k. Intrepid Spirit Center
l. Madigan Medical Mall
m. Pharmacy waiting areas if possible
n. Physical Therapy
o. Physical Medicine and Rehabilitation
p. Coffee bar
q. Dining Facility entrance
r. Intranet screen saver page

If a potential participant expresses interest in learning more about the research study, a member of the research staff will briefly introduce the study, express the voluntary nature of participation, assess interest in participating, and screen the potential participant for eligibility. Eligibility will be determined in person using the Inclusion/Exclusion CRF (Appendix A).

If the potential participant meets eligibility criteria as determined by the Inclusion/Exclusion CRF and expresses interest in participating, an authorized study team member will initiate the formal consent discussion and, if applicable, obtain informed consent.

Pre-screening conversations may also take place over the phone using the Screening Script (Appendix M). Potential participants who meet initial eligibility per the Screening Script and express interest in participating will be asked to come to clinic to complete an Inclusion/Exclusion CRF to confirm final eligibility with an authorized study team member prior to providing informed consent.

Baseline Data Collection (post-consent):

Formal Screening:
All consented participants that are biological females of child-bearing age and capacity will be required to complete a urine hCG pregnancy test, which will be ordered via EMR by a study provider, to confirm eligibility for study participation. MAMC Department of Pathology and Area Laboratory Services (DPALS) will complete urine sample collection and analysis and upload results in the participant's EMR. If the pregnancy test is positive, per the inclusion/exclusion criteria, the participant will be formally withdrawn from the study at this point, and will be encouraged to seek care with their primary care physician. If the pregnancy test is negative, the participant will be eligible to continue with the study procedures. The results of the pregnancy test will be entered into the EMR and in the Inclusion/Exclusion CRF.

Prior to receiving their assigned study treatment, participants will provide their contact information (Appendix B Intake CRF) and complete a series of baseline outcome measures (Appendix C Demographics CRF and Appendix D Baseline Data Collection CRF) and have their plantar fascia thickness measured within the Podiatry clinic. A study team member will also acquire measurements of the participant’s calf, ankle, and foot to calculate the appropriate PBMT dose (see Appendix L).

If a participant has plantar fasciitis on both feet, only one foot will be eligible to receive study treatment. The primary study foot will be determined by the baseline FAAM score indicating the foot with the most disability.

Randomization:
Participants will be randomly assigned to a study group (PBMT+UC or Sham PBMT+UC) using a computer-generated randomization model prepared by the study biostatistician.

Study Treatments (PBMT+UC or Sham PBMT+UC):
All participants, regardless of study arm assignment, will be asked to complete the UC Protocol (Appendix H) which consist of a daily regimen of stretching and cryotherapy that includes 3-5 minutes of stretching upon waking, then approximately 3-5 minutes of stretching and 3-5 minutes of cryotherapy throughout the day, for the duration of 6 weeks (instructions and participant handout will be provided, Appendix I).

Participants will receive PBMT or sham-PBMT with the PBM device (Appendix J, Figure 1) over the course of three consecutive weeks (three treatments per week). PBM treatments will take

approximately 5-10 minutes to administer at each session. Specific treatment parameters will be based on measurements of calf, ankle, and foot using pre-calculated treatment tables; participants will receive 10 J/cm2, 25W output power, and the length of the treatment will be dependent on treatment area (size).

Photobiomodulation Therapy (PBMT):
PBMT will be administered by a trained member of the study team using the LightForce® XPi therapy laser, provided by LiteCure, LLC/DJO Global (New Castle, DE). The LightForce® XPi therapy laser is an FDA cleared device for the treatment of pain. The trained team members will use the Smart Hand Piece technology, which achieves effective treatments and improves dosing accuracy by assessing the operator's speed and providing real-time visual (red – amber – green light) and sensory feedback (Appendix J, Figure 2). The Smart Hand Piece is calibrated to shut-off when moving too slowly, and warn the operator when moving too fast by vibrating. The therapy is delivered through a flexible optical fiber threaded through the hand piece, which contains a rolling sapphire massage ball. The PBM therapy will be administered by rolling the massage ball over the plantar surface of the foot and dorsal aspect of the calf in contact with the participants' skin.

Sham-Photobiomodulation Therapy (Sham-PBMT):
Sham-PBM treatment time will be calculated in the same way as the PBM treatment group, with the time of treatment dependent on the size of the treatment area. The sham-PBMT will be administered by rolling the massage ball over the plantar surface of the foot and dorsal aspect of the calf in contact with the participants' skin. Because emission of photons at the selected treatment parameters may cause participants in the treatment group to feel warmth, the massage ball will be warmed in the sham-PBMT. The device will be turned on, so the red aiming beam will be visible, but the operator will not activate the switch to emit photons. The following safeguards will be in place to prevent exposure to PBM and potential unexpected crossover or protocol deviations, as follows:

- The PBM device requires multiple steps to emit photons. The device first must be powered on, then settings are selected (in this case power will be 25 watts, and the time will be determined by the algorithm based on the treatment area measurements). Next, there is a 'standby' button that is activated on the touch screen, and finally, there is a finger switch on the handpiece that must be pressed to initiate the treatment. There is a beep that sounds for the duration of the active treatment.
- For the sham condition, the device will be turned on and the settings will be selected, but the standby button and the finger switch on the handpiece will not be activated. This way, there is no chance that the device will be emitting photons. Since the device will not emit active treatment, there will not be a beeping sound from the device; this beeping noise will be replicated in another way for the sham-PBMT.

At the completion of the initial 6 weeks, Sham-PBMT participants will be unblinded, and may choose to cross-over and complete another 6 weeks in the active treatment group. Participants will have up to two weeks after the time of unblinding to elect to crossover. If they choose to crossover and receive active PBMT, they will re-complete all of the original study procedures (with the exception of screening, as we've already ensured they qualify for the study, and baseline data collection, as we will use the 6-week follow-up data as the new baseline prior to active PBMT treatment).

Follow-Up Data Collection:
In addition to their 3x weekly for 3 weeks PBM or Sham-PBM treatments, participants will report to the study team in person approximately 3 weeks (+/- 3 days) and 6 weeks (+/- 3 days) after the start of their PBM or Sham-PBM treatment to complete the follow-up questionnaires (Appendix E), turn in their Pain Diary (Appendix F), and undergo ultrasound imaging to measure changes in plantar fascia thickness at 3-weeks and 6-weeks (see below).

Long-term follow-up questionnaires may be captured remotely (e.g., entered directly into REDCap using a personalized coded link with no log-in required, verbally over the phone with a study team member, etc.), or in-person (using Appendix U Long-Term Follow-Up Data Collection CRF) at approximately 3 months (+/- 10 days) post-start of PBM treatment. For Sham-PBMT participants who cross-over, their 3-month follow-up will be timed from the first day of their active PBM treatment, not their Sham-PBM treatment. Reminder phone calls and emails will be sent to participants at the phone and email address provided to the study team before the 3-month follow-up time point.

Participants will be evaluated for adverse events at each follow-up time point and any complications will be documented.

Study participation ends after the 3-month follow-up research activities are completed. Participants initially randomized to the PBMT group will participate in the study for approximately 3 months. Participants initially assigned to the Sham-PBMT group who choose to crossover and receive active PBMT post-unblinding will be in the study for approximately 4.5 months total. If the participant is a biological female of child-bearing age and/or capacity, they will be required to complete another hCG urine pregnancy test at this time. Results must be negative (i.e., indicating not pregnant) to be eligible to continue with PBM treatment. If the results are positive (i.e., indicating pregnant), the participant will be deemed ineligible by formal screening criteria, and they will be ineligible to receive the elective study treatment.

Ultrasound Measurement:
Plantar fascia thickness will be measured by an MSK US trained provider utilizing an ultrasound system. The participant will be identified on the ultrasound system using only the assigned participant ID. The patient will be positioned prone on an examination table with the leg extending off the end so the foot projects downward in a relaxed state. Using a linear transducer for best resolution, the plantar fascia will be evaluated in the long axis to determine the site to be measured as identified by the bony contour demonstrated in Appendix J, Figure 3. The vertical thickness of the plantar fascia will be documented in both long and short axis at this point. The points measured will be from the edge of the bone to the outer layer of the plantar fascia.

Plantar fascia thickness will be measured in two orthogonal planes (90 degrees different - long axis and short axis of the structure) at the site identified by the bone contour in Appendix J, Figure 3. The measurement will be conducted by MSK US trained providers, either in Physical Therapy or Physical Medicine and Rehab clinics.

These images will be uploaded to the Teleray data platform. More information in Managing Data Sections 10.14-10.15.

Missed Appointments and Study Removal:
If a participant misses a scheduled appointment, they will be contacted to reschedule in order to maintain the treatment plan of their assigned study treatment group, (i.e., three times a week, for three weeks). In the event that a participant misses an appointment, study staff will make one attempt to reschedule each day on three separate days (for three total attempts to reschedule). If the participant cannot be reached or does not respond/reschedule, they will be removed from the study due to non-compliance.

A participant adherence log can be found in Appendix N.

A study process flowsheet can be found in Appendix O.

Data Entry:
With the exception of the Intake CRF which collects participant contact information, all coded research data will be entered into REDCap, an encrypted, access controlled, password protected electronic data capture and management system housed on a DoD server and maintained by the Uniformed Services University (USU). No PHI/PII will be entered into REDCap.

See Appendix R for additional information on REDCap.

Additional Info - MIRROR/USU:
Musculoskeletal Injury Rehabilitation Research for Operational Readiness (MIRROR), which is based out of the Department of Physical Medicine & Rehabilitation (PM&R) at the Uniformed Services University (USU), is serving as the Data Coordinating Center for this study and will also be providing remote regulatory support. Staff from MIRROR/USU will not interact with human subjects and will not have access to the paper research records or any identifiable research data to include the Master List, the Informed Consent Documents/HIPAA Authorizations, or any other form of participant PHI/PII.

De-identified research data will be shared with MIRROR/USU and maintained indefinitely for possible use in future research.

There will be appropriate data sharing agreements in place.

10.2 Data Collection:

Describe all the data variables, information to be collected, the source of the data, and how the data will be operationally measured.

Instrument	Characteristics	Outcome Measure
Demographics CRF & Baseline Data Collection CRF	The Demographics CRF (Appendix C) and Baseline Data Collection CRF (Appendix D) will be used to obtain demographic information, Fitzpatrick Skin Phototype, and foot, ankle, and calf measurements for PBMT dosage calculation. The Fitzpatrick Skin Prototype is a rating of susceptibility to skin damage from ultraviolet (UV) radiation. (49)	Demographic Information; measurements for dose calculation
Foot and Ankle Ability Measure (FAAM)	The FAAM is a 29-item self-report instrument that assesses physical function in foot and ankle impairments which included PF cases in development. There are two subscales, Activities of Daily Living (21-item) and Sports (8-item). Each item is scored on a 5-point Likert scale (4='no difficulty at all' to 0='unable to do'); points are transformed to a percentage (100%=no dysfunction). Test-retest 0.89 & 0.87 for ADL & Sports subscale; internal consistency α=.98, minimum clinically important difference 8 & 9 points for ADL & Sports subscale, respectively. (50) (Appendices D-E).	Aim 1: Primary outcome measure for function; collected at baseline, daily days 2-43 (during and post treatment), 3 months.
Pain Diary Defense and Veterans Pain Rating Scale (DVPRS)	Defense and Veterans Pain Rating Scale (DVPRS) 72. This 5-item scale integrates a numeric pain rating scale with visual facial cues and word descriptors as well as 4 supplemental questions on pain interference. Construct validity using component factor analysis revealed one item group (factor loadings >.78 and >.81) for outpatient and inpatient participants, respectively, with high internal consistency (.87-.90). (51, 52) The daily Diary will include the DVPRS, and space to document any medications taken and activity completed during each 24-hour period to attempt to explain potential variation. (Appendices D, E, & F)	Aim 1: Primary outcome measure for pain; DVPRS collected at baseline, daily days 2-43 (during and post treatment), 3 months.
Ultrasound Measurement (Plantar fascial thickness)	Ultrasound measurement as described in section 10.1 above.	Aim 2: Primary outcome measure for effect of PBMT on plantar fascial thickness (change in thickness); collected at baseline, 3 weeks, and 6 weeks

10.3 At any point in the study, will you request, use, or access health information in any form, including verbal, hard copy and electronic?

(●) Yes ( ) No

10.4 Review the definitions below and respond to the following two questions. If you are not sure of the answers, email DHA.PrivacyBoard@mail.mil for assistance. The *Military Health System (MHS)* is defined as all DoD health plans and DoD health care providers that are organized under the management authority of, or in the case of covered individual providers, assigned to or employed by, the Defense Health Agency (DHA), the Army, the Navy, or the Air Force *MHS workforce members* are employees, volunteers, trainees, and other persons whose conduct, in the performance of work for the MHS, is under the direct control of the MHS, whether or not they are paid by the MHS. *MHS business associates* are persons or entities that provide a service to the MHS and require protected health information (PHI) to provide the service.

Are you an MHS workforce member?

(•) Yes, I am an MHS workforce member
( ) No, I am not an MHS workforce member

Are you an MHS business associate?

( ) Yes, I am an MHS business associate
(•) No, I am not an MHS business associate

10.5 Have you consulted with an MHS data expert to determine the data elements required for your study?

Consulting with a data expert often saves time later in the compliance process because the data expert can advise on the data available in the numerous MHS information systems, the quality of that data and the methods for encrypting and collapsing data. To schedule a consult with an MHS data expert, send an email to: (**DHA.PrivacyBoard@mail.mil**)

( ) Yes, then complete the questions below according to the data consult
(•) No, then complete the questions below according to the best of your knowledge

10.6 Indicate how you will request data from the MHS. Select all that apply.

[x] Talking with MHS health care providers or MHS health plans about specific research participants
[ ] Obtaining MHS hard copy records specific to research participants
[x] Obtaining data from an MHS information system(s)

10.7 If you are obtaining data from an MHS information system(s), indicate whether you plan to receive a data extract or whether you plan to access an MHS information system directly to create a data set.

A data extract is when the MHS or a contractor provides the data set directly to the researcher. When receiving a data set through data extract, the researcher may indicate whether the data elements should be provided as is, encrypted or collapsed. In contrast to a data extract, access to an information system means that the researcher may directly access an MHS information system and create a data set for the research study

[ ] Data Extract
[x] Access

10.8 Do you intend to request de-identified data from the MHS in your research study?

There are different two methods for de-identifying data pursuant to HIPAA:
1) Safe Harbor Method: Removing all of the identifiers listed in Table 1 below, provided that the researcher does not have actual knowledge that the remaining data can be used alone or in combination with other information to identify the individual who is the subject of the information
2) Statistical Method: An expert, with appropriate knowledge of and experience with generally accepted statistical and scientific principles and methods for rendering information not individually identifiable, determines that the data is not individually identifiable

( ) Yes (•) No

10.9 Indicate the MHS information system(s) from which you will seek to obtain data

If you do not know which system(s) contains the data elements you need, refer to the Guide for DoD Researchers on Using MHS Data or request guidance from an MHS data expert at: **DHA.PrivacyBoard@mail.mil**.

Below is a list of commonly used MHS systems. If the system from which you seek to obtain data is not listed below, list the name of the system in the "Other MHS Systems" category below
PHI Systems:

MHS Information System	Requesting Data

: CHCS	: Yes

PII-Only Systems:

MHS Information System	Requesting Data
No records have been added	

De-Identified Data & Other Systems:

Information System	Requesting Data
Other MHS System (May include PII and/or PHI) List other system here: Genesis	: Yes

10.10 Do you intend to merge or otherwise associate the requested data with data from any sources outside of the MHS, including other DoD systems that are not part of the MHS?

- ○ Yes, will merge data
- ◉ No, will not merge data

10.11 Indicate the data elements about research participants or relatives, employers, or household members of the research participants that you will request from MHS hard copies or from MHS information systems.
If you will merge data, also indicate non-MHS data elements about research participants or relatives, employers, or household members of the research participants that you will have access to in any form or medium.

Direct and Indirect Identifiable Data Elements	DHA Hard Copies	DHA Data Elements to be Accessed	DHA Data Elements Verbal	Extracted DHA Digital Data	Downloaded DHA Digital Data	Non-DHA Hard Copies or Digital
1. Names	☐	☑	☐	☐	☐	☐
2. Postal address with only town, city, state, and zip code	☐	☐	☐	☐	☐	☐
3. Postal address with all geographic subdivisions smaller than state, including street address, city, county, precinct, zip code and their equivalent geocodes,						

except for the initial three digits of a zip code if, according to the current publicly available data from the Bureau of Census: 1) the geographic unit formed by combining all zip codes with the same three initial digits contains more than 20,000 people; and 2) the initial three digits of a zip code from all such geographic units containing 20,000 or fewer people is changed to 000	☐	☑	☐	☐	☐	☐
4. Dates including all elements (except year) directly related to an individual, including birthdate, admission date, discharge date, and date of death	☐	☑	☐	☐	☐	☐
5. Ages over 89 and all elements of dates (including year) indicative of such age, unless you will only request a single category of "age 90 or older"	☐	☐	☐	☐	☐	☐

6. Telephone Numbers	☐	☑	☐	☐	☐	☐
7. Fax Numbers	☐	☐	☐	☐	☐	☐
8. Email Addresses	☐	☑	☐	☐	☐	☐
9. Social Security Numbers	☐	☐	☐	☐	☐	☐
10. Medical Record Numbers (MRN) (including record ID)	☐	☐	☐	☐	☐	☐
11. Health Plan Beneficiary Numbers (including DEERS ID, Electronic Data Interchange Personal Identifier (EDIPI) or Number (EDIPN))	☐	☐	☐	☐	☐	☐
12. Account Numbers	☐	☐	☐	☐	☐	☐
13. Certificate /License Numbers	☐	☐	☐	☐	☐	☐
14. Vehicle identifiers and serial numbers, including license plate numbers	☐	☐	☐	☐	☐	☐
15. Device identifiers and serial numbers	☐	☐	☐	☐	☐	☐
16. Web Universal						

Resource Locators (URLs)	☐	☐	☐	☐	☐	☐
17. Internet Protocol (IP) address numbers	☐	☐	☐	☐	☐	☐
18. Biometric identifiers, including finger and voice prints	☐	☐	☐	☐	☐	☐
19. Full-face photographic images and any comparable images	☐	☐	☐	☐	☐	☐
20. Any other unique identifying number, characteristic, or code (including non-military provider IDs)	☐	☑	☐	☐	☐	☐
21. Free Text Fields	☐	☐	☐	☐	☐	☐

If you are obtaining SSNs, provide a justification as to why and explain why a substitute cannot be used.

Due to guidelines stated within DoDI 1000.30, Reduction of SSN Use within DoD, the reduction or elimination of SSN usage must occur wherever possible. If SSNs are required to complete the project, the PI must provide a justification and explanation as to why a substitution cannot be used.
For example:

- If alternatives to SSN (e.g., EDIPNs or pseudo person IDs) are sufficient in other instances, will those alternatives to SSN usage be sufficient to respond to Congressional inquiries and /or Senior DoD stakeholders inquiries?
- Are alternatives to SSN used first?
- Are those alternatives to SSN insufficient to combine data from multiple data sources? Is the issue that some individuals do not possess alternatives ID numbers and SSN is the only way to identify them?

N/A

a. Will you receive or obtain health information?

> ***Note:*** *If you indicate you are not receiving health information, the answer must be consistent with the DHA data source. For a non-health information data request, if you are a non-MHS employee or non-MHS business associate, you may not access an information system that has*

*PHI or LDS. For both MHS and Non-MHS employees and MHS business associates, you may **NOT** include data elements in the above table on: 1) lines 10 or 11, 2) line 21 if the free text field comes from a PHI or LDS system, and 3) lines 12, 13, or 18 if the account numbers, certificate and license numbers, biometric data, or any other data elements are health information created or received by an MHS health care provider, health plan, or business associate in relation to the physical or mental health or condition of an individual or payment for health care.*

(●) Yes, I will receive or obtain health information

( ) No, I will not receive or obtain health information

b. If no data elements were checked in the above table, is it possible that the requested DHA data is or will be identifiable because of any unique data elements, triangulation, or small cell size?

☑ Data elements were checked in the above table, STOP HERE.

***NOTE:** A unique data element includes any unique features that alone are not identifiable but that could be used to identify an individual within the context of other information, such as any type of code (such as diagnosis or procedural), rank of general or admiral, gender, or race. Triangulation means using different data elements that when combined can be used to identify an individual, such as including the above lists of unique data elements in a data set. Determining whether an individual is identifiable through triangulation requires consideration of all data elements in combination. Within the military, the use of rank and/or diagnosis code, procedural codes, or any other code that changes on a predictable basis, increases the possibility of identification. Small cell size means that there is only a small number of eligible individuals that satisfy the category description. Department of Defense Manual 6025.13, Medical Quality Assurance and Clinical Quality Management in the Military Health System MHS, provides that the threshold for de-identifying data within the MHS requires a cell size of three, but also states that the de-identification standards must meet the DoD implementation of the HIPAA Privacy Rule. Centers for Medicare and Medicaid also gives guidance on small cell size stating that no data cell less than 11 may be published or displayed. However, the Office for Civil Rights' OCR, which is the official regulatory office for the HIPAA Privacy Rule, provides that OCR does not designate a universal value for small cell size in accordance with the de-identification standard; instead, the cell size should be set at a level that is appropriate to mitigate risk of identification by the anticipated recipient of the data set. This means that a cell size of 3 or 11 may not meet the HIPAA Privacy Rule requirements if the cell size level does not appropriately mitigate risk of identification by the anticipated recipient of the data set.*

Note: If dates are altered as a means of de-identifying the data, diagnosis and procedural codes need to be rolled-up or collapsed. If dates are provided "as time between events," the roll-up is not necessary.

☐ Yes, the DHA data will become identifiable

☐ No, the DHA data will not become identifiable

10.12 Do you believe it is possible for the MHS data to become identifiable because of triangulation, a small cell size, or any unique data element(s)?

Triangulation means using different data elements that are not themselves identifiable but that when combined can be used to identify an individual. For example, triangulation would use rank and race together to determine the identity of an individual with a particular health condition.

Small cell size means that there is only a small number of eligible individuals that satisfy the category description. Guidance for acceptable cell size is available from the Centers for Medicare and Medicaid Services. For example, the rank category of four star generals with a particular diagnosis may be less than 30, so the rank category may need to be expanded to include lower ranks.

A unique data element includes any unique features that are not explicitly enumerated in the categories of data in rows 1 – 20 of the table above (in Section 10.10), but that could be used to identify an individual. Unique data elements include characteristics that are not themselves identifying, such as the rank of general or admiral, or a race or gender, but within the context of other information could be identifiable.

- ○ Yes, I believe there is a reasonable possibility the MHS data will become identifiable
- ◉ No, I believe there is no reasonable possibility the MHS data will become identifiable

10.13 Have you completed and uploaded an appropriate HIPAA document (i.e. HIPAA Authorization will be obtained or Waiver/alteration of HIPAA Authorization is being requested)?

- ◉ Yes
- ○ No
- ○ N/A

If yes, please check which one.

- ○ HIPAA Authorization
- ○ HIPAA Waiver (Full or Partial)
- ◉ Other (please provide copies when uploading Other Study Documents)

10.14 Managing Data (Data Management and/or Sharing Plan) and/or Human Biological Specimens for this Study:

Include in this section the plan for acquiring data (both electronic and hard copy), access during the study, data/specimen storage and length of time stored, shipment/transmission, and the plan for storage and final disposition at the conclusion of the study. Describe any data agreements in place for accessing data within and/or outside of your institution (e.g., Data Sharing Agreement, Data Use Agreement, Business Agreements, etc.)

Data Capture Methods:
The local study team will collect study data directly from the study participant (including in person, via mail or email, or over the phone), from their attending provider(s), clinical evaluations or, where applicable, from the participant's medical record (i.e., relevant medical and treatment history and relevant clinical notes) and record it on study Case Report Forms (CRFs) (see Appendices A-F, T-U).

The completed CRFs will serve as source documents for this study. Other source documents include relevant clinical notes, imaging, and/or test results which, if applicable, will be redacted and stored in the participant's research file.

Participants may also enter their coded data directly into REDCap using a personalized survey link (no log-in required). In these cases, the completed REDCap questionnaire(s) will be printed and added to the participant's research record as a source document.

Electronic Data Entry:
Following each research visit, a local study team member will review any completed paper CRFs for accuracy and completeness and then enter the collected non-personally identifiable data from the paper CRFs into REDCap, an encrypted, access controlled, password protected electronic data capture and management system housed on a Department of Defense (DoD) server and maintained by the Uniformed Services University Information Technology (USU IT).

Please see Appendix R for additional information on REDCap.

Ultrasound images will be uploaded to Teleray, more information is outlined below.

Data Storage & Access:
With the exception of the Informed Consent Form, HIPAA Authorization, Intake CRF, and electronic Master List (see Appendix G), all research data (both paper and electronic) will be identified using a unique study ID only, and not by the participant's name, date of birth, DoD ID, or other protected identifier.

Paper research forms and source documents will be stored in a locked cabinet inside of a locked room within the Podiatry Clinic.

Ultrasound images will be uploaded to Teleray. Teleray ensures that all accounts stored in Microsoft Azure's self-healing network with advance security protocols enabled and is only located in the USA Secure Connection: The sessions established are secure (with secured tokens

that are regenerated). Random AES keys are generated by clients at the beginning of the media connection and, to increase security, additional keys are generated periodically throughout the session. Teleray employs Transport Layer Security (TLS) to encrypt video data. The core protocols used are Secure Real-time Transport Protocol (SRTP) for media traffic encryption and Datagram Transport Layer Security (DTLS)-SRTP for key negotiation, both of which are defined by the Internet Engineering Task Force (IETF). The endpoints use Advanced Encryption Standard (AES) cipher with 256-bit keys to encrypt audio and video, and Hash-based Message Authentication Code- Secure Hash Algorithm 1 (HMAC-SHA1) to verify data integrity. No PHI/PII will be entered into Teleray. Access to the coded data uploaded to Teleray will be controlled and managed by the local research team.

The coded electronic research data for this study will be stored in REDCap, an encrypted, access controlled, password protected electronic data capture and management system housed on a Department of Defense (DoD) server and maintained by the Uniformed Services University Information Technology (USU IT). No PHI/PII will be entered into REDCap.

This coded electronic research data will be accessible by authorized staff from Musculoskeletal Injury Rehabilitation Research for Operational Readiness (MIRROR) which is based out of the Department of Physical Medicine & Rehabilitation (PM&R) at the Uniformed Services University (USU) and is serving as the data coordinating center for this research study. Access to the electronic coded research data will be governed strictly on an individual-by-individual basis within REDCap. Individual data access as well as privileges will be clearly delegated, audited, and monitored by MIRROR/USU. Staff from MIRROR/USU will not have access to the paper research records or any identifiable research data.

The local study team will maintain a separate electronic master list which matches unique study IDs with participant identifying information. The electronic master list will be stored separately from the coded electronic research data in a secure, password protected document on a computer and network that requires CAC access and will only be accessible by local research staff.

All research data and forms (both paper and electronic) will only be accessible by authorized study staff, authorized staff from MIRROR/USU (coded data entered into REDCap and Teleray only, as described above), the IRB of record, the local research office (if applicable), and applicable governmental agencies as part of their duties and in accordance with federal law. These duties include making sure that research participants are protected.

There will be appropriate data sharing agreements in place.

Informed Consent Forms and HIPAA Authorizations will be maintained for a period of 6 years following study closure and then securely shredded. Paper research forms will be maintained for a period of 5 years following study closure and then securely shredded. The master list connecting unique study ID to participant identifiers will be destroyed as soon as all data collection is completed and analyzed, and no later than one year following study closure. The electronic coded research data will be maintained indefinitely as described below in protocol section 10.15.

Is this a data repository?

○ Yes ◉ No

If Yes, provide name of the Repository.

N/A

Who will have access to the Repository?

N/A

What data type will be stored in the Repository?

☐ PHI
☐ LDS
☐ De-identified Data

10.15 Managing Data (Data Management and/or Sharing Plan) and/or Human Biological Specimens for Future Research:

If the study involves collecting, storing, or banking human specimens, data, or documents (either by the Investigator or through an established repository) for FUTURE research, address. How the specimens/data will be used, where and how data/specimens will be stored (including shipping procedures, storage plan, etc.), whether and how consent will be obtained, procedures that will fulfill subjects' request as stated in the consent, whether subjects may withdraw their data/specimens from storage, whether and how subjects may be recontacted for future research and given the option to decline, whether there will be genetic testing on the specimens, who will have access to the data/specimens, and the linkage, the length of time that data/specimens will be stored and conditions under which data/specimens will be destroyed.

Long Term Data Storage & Access:
The de-identified electronic dataset will be maintained by MIRROR/USU and the study team indefinitely or as long as it is practicable to maintain.

The de-identified data uploaded to Teleray will be maintained by the local research team indefinitely, or as long as it is practical to maintain, and while funding is allotted for this service.

De-identified electronic research data will be securely transmitted from local study teams to the MIRROR /USU via REDCap, Teleray, or the DoD SAFE application (or other comparable safe data sharing system implemented by the local site and/or the US Army/DHA). REDCap utilizes Secure Sockets Layer (SSL) in addition to other safeguards on its web server to maintain secure communication with end-users (see Appendix R). DoD SAFE uses a TLS (Transport Layer Security) protocol when files are uploaded and downloaded. TeleRay employs Transport Layer Security (TLS) to encrypt video data. The core protocols used are SRTP for media traffic encryption and DTLS-SRTP for key negotiation, both of which are defined by the IETF. The endpoints use AES cipher with 256-bit keys to encrypt audio and video, and HMAC-SHA1 to verify data integrity.

Once received, the electronic de-identified research data will be stored within an encrypted, access controlled, password protected electronic data capture and management system housed on a Department of Defense (DoD)-compliant server.

Access to the de-identified research data will be governed strictly on an individual-by-individual basis within the secure electronic data capture and management system. Individual data access as well as privileges will be clearly delegated, audited, and monitored by MIRROR/USU.

Any future research using retained data will require a research protocol to be approved by an Institutional Review Board or other authorized official responsible for protecting human subjects of research.

Consent for Future Use:
The Informed Consent Form for this research study states that de-identified research data will be shared with MIRROR/USU and maintained indefinitely for possible use in future research. By consenting to participate in this research study, participants agree to allow us to maintain their de-identified research data indefinitely for possible use in future research.

Participants will not be given the option to opt out of us retaining their de-identified research data indefinitely for possible future use. The consent form states, "If you do not want your deidentified data collected as part of this research study to be kept for use in future research studies, you should not sign this consent form."

We are also requesting to store identifiable data for possible use in future research. Participants will be given the option to opt-in or opt-out for the possible use of their identifiable data in future research.

Data Withdrawal from Storage:
Participants may request to have their data withdrawn at any time before their personal identifiers have been removed. Once their data has been de-identified, it will be impossible for the researchers to locate their specific study data.

Is this a data repository?

(•) Yes ( ) No

If Yes, provide the name of the Repository

USU OCIO REDCap

Who will have access to the Repository?

MIRROR core team members, study investigators and study team members, as appropriate

What data type will be stored in the Repository?

- [ ] PHI
- [ ] LDS
- [x] De-identified Data

11.0 Statistical/Data Analysis Plan

11.1 Statistical Considerations:

List the statistical methods to be used to address the primary and secondary objectives, specific aims, and/or research hypotheses. Explain how missing data and outliers will be handled in the analysis. The analysis plan should be consistent with the study objectives. Include any sub-group analyses (e.g., gender or age group). Specify statistical methods and variables for each analysis. Describe how confounding variables will be controlled in the data analysis

Descriptive statistics for each variable will be reported as central tendencies in terms of location (e.g., mean, median) and scale (e.g., variance, interquartile interval). Inferential analyses will use the Mann-Whitney U test (a non-parametric analogue of Student's t-test) for simple comparisons and regression analysis with outcome-appropriate distribution families and link functions for multivariable comparisons. The FAAM sports subscale will be standardized by the multiplicative inverse of the patient-level maximum possible score. The primary outcome will be computed as the patient-level, six-week change in standardized FAAM sports subscale. Sensitivity analyses will be conducted using regression to control for patient-level demographics. Hypothesis tests will be two-tailed and statistical significance will be considered at the putative threshold (alpha=0.05). Effect sizes will be compared to a minimum clinically important difference.

11.2 Sample Size:

Assuming approximately 20% attrition, we are requesting to enroll up to 100 participants (approx. 50 per arm).

11.3 Total number of subjects requested (including records and specimens):

100

11.4 If you are recruiting by study arm, please identify the arms of the study and how many subjects will be enrolled in each arm

Up to 100 participants will be randomized to one of two study arms (PBMT+UC or Sham-PBMT+UC) in a simple, random fashion, with approximately 50 participants in each arm.

11.5 Please provide a justification for your sample size

We found that enrolling 78 and retaining at least 60 patients by the six-week follow-up would be sufficient to yield >80% power for a moderate effect size (Mean six-week decrease in FAAM sports subscale: delta = 0.20) and a moderate standard deviation in effect (Std dev of six-week change in FAAM sports subscale: SD = 0.2), assuming the control effect mean and standard deviation are 0 and 0.22, respectively. Under similar constraints but with a standard deviation <0.18, the study would yield power >90%. Power was estimated using 1 million iterations of a Monte Carlo simulation based on effect means and standard deviations estimated from pilot data. Technical details will be made available upon request.

In order to meet enrollment goals during the expected period of performance, recruitment will be expanded in addition to the current load of plantar fasciitis patients receiving care in the MAMC Orthopaedic and Podiatry clinics (a conservative estimate of approximately 80 patients per month), to reach potential participants receiving care in other departments including Family Medicine, Physical Therapy, and Physical Medicine & Rehabilitation (PM&R) clinics.

11.6 Data Analysis Plan: Complete description: Background, Objectives, Design, Step by Step how the project is going to be done, Data analysis plan:

Descriptive statistics for each variable will be reported as central tendencies in terms of location (e.g., mean, median) and scale (e.g., variance, interquartile interval). Inferential analyses will use the Mann-Whitney U test (a non-parametric analogue of Student's t-test) for simple comparisons and regression analysis with outcome-appropriate distribution families and link functions for multivariable comparisons. The FAAM sports subscale will be standardized by the multiplicative inverse of the patient-level maximum possible score. The primary outcome will be computed as the patient-level, six-week change in standardized FAAM sports subscale. Sensitivity analyses will be conducted using regression to control for patient-level demographics. Hypothesis tests will be two-tailed and statistical significance will be considered at the putative threshold (alpha=0.05). Effect sizes will be compared to a minimum clinically important difference.

Data will be analyzed on a complete-case basis with regards to each planned analysis. For example: if a patient has missing data after the 3-month follow-up due to being removed from the study (and they have full data prior to the 3-month follow-up), their data may still be considered for analyses which only consider baseline and the 6-week follow-up but will be omitted from any analyses which consider one or more time points beyond the 3-month follow-up.

12.0 Participant Information

12.1 Subject Population:

DEERS eligible, adults between the ages of 18-64 (inclusive) diagnosed with plantar fasciitis (PF).

12.2 Age Range:

Check all the boxes that apply. if the age range of potential subjects (specimens, records) does not match the range(s) selected, please specify in the text box.

- [ ] 0-17
- [x] 18-24
- [x] 25-34
- [x] 35-44
- [x] 45-54
- [x] 55-64
- [ ] 65-74
- [ ] 75+

12.3 Gender:

- [x] Male
- [x] Female
- [ ] Other

12.4 Special categories, check all that apply

- [ ] Minors /Children
- [ ] Students
- [x] Employees - Civilian
- [ ] Employees - Contractor
- [x] Resident/trainee
- [ ] Cadets /Midshipmen
- [x] Active Duty Military Personnel
- [ ] Wounded Warriors
- [ ] Economically Disadvantaged Persons
- [ ] Educationally Disadvantaged Persons
- [ ] Physically Challenged (Physical challenges include visual and/or auditory impairment)
- [ ] Persons with Impaired Decisional Capacity
- [ ] Prisoners
- [ ] Pregnant Women, Fetuses, and Neonates
- [ ] Non-English Speakers
- [ ] International Research involving Foreign Nationals - Headquarters Review is necessary

You must also consider the requirements of DoDI 3216.02, paragraph 7.e.

You must also consider the requirements of DoDI 3216.02, Enclosure 3, paragraph 7.e.

12.5 Inclusion Criteria:

Order Number	Criteria
1	DEERS Eligible
2	Between the ages of 18-64 (inclusive) years
3	Able to read and understand English language for consent purposes
4	Currently experience pain in the bottom of your foot and/ or heel at any time during the day
5	Diagnosed with plantar fasciitis or plantar heel pain by a healthcare provider based on accepted diagnostic criteria
6	Able to commit to study procedures, including a 6-week intervention and 3-month follow-up?

12.6 Exclusion Criteria:

Order Number	Criteria
1	History of traumatic injury to symptomatic foot/feet
2	Diagnosed with a calcaneal (heel) fracture by a healthcare provider
3	Previous surgery or other invasive treatment for same condition
4	Significant portion of calf area covered in tattoos/ink/scarring (pigment in ink can absorb light, causing overheating of skin)
	Current use of pacemaker

5	
6	History of neuropathy or inability to detect changes in skin temperature (increased risk of skin warming due to inability to detect change)
7	Current use of medications associated with sensitivity to heat or light (e.g., amiodarone, chlorpromazine, doxycycline, hydrochlorothiazide, nalidixic acid, naproxen, piroxicam, tetracycline, thioridazine, voriconazole)
8	Current or chronic sciatica resulting in chronic or intermittent lower extremity pain, numbness, or tingling
9	Concurrent participation in another research study addressing pain issue
10	Currently pregnant or plan to become pregnant during intervention period (safety of PBM not established in pregnancy)
11	Previous enrollment in this study for contralateral foot
12	Provider disagreement with any of the potential participant's screening answers
13	History of memory problems, dementia, and/or impaired decision-making ability
14	Any other medical condition that preclude safe participation in the study procedures

13.0 Recruitment and Consent

13.1 Please describe the recruitment process, including how subjects will be identified and selected for the study.

Potential participants will be identified via four methods:

1. Under the provisions of the Partial HIPAA Waiver, the local study team will review medical records of patients coming in to the Orthopaedic clinic for suspected plantar fasciitis to identify prospective research participants for the purposes of seeking their authorization to participate/use their protected health information for this research study. In these cases, the study team will receive approval from the potential participant's provider prior to approaching for possible study participation.
2. Direct referral from local healthcare providers in the local Family Medicine, Podiatry, Physical Therapy, and Physical Medicine & Rehabilitation clinics.
3. Patients may self-refer to participate in the study. Interested potential participants will be able to contact a member of the study team via phone or email. Potential participants who contact the study team directly will be instructed to access the Physical Therapy clinic or their primary care manager for a physical exam and diagnosis of PF, or confirmation of a previous PF diagnosis.
4. Study advertisements will be posted within the following locations, and copies will be provided to clinic staff:
    a. Internal Medicine
    b. Aviation Medicine
    c. McChord Clinic
    d. Winder Clinic
    e. Okubo SCMH
    f. Allen Soldier -Center Medical Home
    g. SRU
    h. Puyallup Community Medical Home
    i. South Sound Community Medical Home
    j. Armed Forces Wellness Center
    k. Intrepid Spirit Center
    l. Madigan Medical Mall

m. Pharmacy waiting areas if possible
n. Physical Therapy
o. Physical Medicine and Rehabilitation
p. Coffee bar
q. Dining Facility entrance
r. Intranet screen saver page

An appropriate Partial HIPAA Waiver application has been uploaded with this submission.

Participants may self-refer to the study. Interested potential participants will be able to contact a member of the study team (PI or RC) via phone or email. A process flowsheet can be found in Appendix O. Participants who contact the study team directly will be instructed to access the Physical Therapy clinic or their primary care manager for a physical exam and diagnosis of PF, or confirmation of a previous PF diagnosis. The Physical Therapy Clinic is a direct access clinic that does not require a referral.

Participants who are identified by clinic staff will be provided with information for contacting the study team.

The local research team will keep a separate electronic screening log containing DoD ID number, ineligible/eligible, and date screened. This log will be password protected and stored in a secure folder on a secure drive accessible only by authorized local research staff. This log is needed to avoid any duplicative screening of those that are screen failures or who decline study participation. This reduces burden on potential participants, providers, and study team members and ensures the study team will not screen the same person twice or examine records for eligibility criteria when screen status has already been already established.

13.2 Compensation for Participation:

Participants may receive $60 to $80 for their participation in this research. Participants that are initially randomized to the sham PBM group, and choose to crossover to receive active PBM and to stay in the study for an additional 6 weeks, are eligible for an additional $20 for completing the study pain diary.

In accordance with the DoDI 3216.02, a federal employee (e.g. civil servant or Service member) completing a research activity while on duty will not be paid for their time spent taking part in that research activity. A federal employee completing a research activity while off duty will be paid for their time spent taking part in that research activity, following the schedule below.

Non-federal employees will be paid for their time spent taking part in research activities, following the schedule below.

There are four opportunities for receiving compensation:

1. when a participant completes the 3-week follow-up visit - $20
2. when a participant turns in the final pain diary on day 43 - $20,
3. when a participant completes the 3-month follow-up questionnaires - $20,
4. when a participant turns in the pain diary on day 43 post-elected crossover (only applicable to those initially randomized to the sham PBMT group that elect to crossover to receive treatment with active PBMT) - $20

Participants will receive payment in the form of a gift card or Visa-type card equivalent. Participants will only be paid for applicable research activities that they complete. They will not receive compensation for research activities they do not complete.

In order to receive compensation for participation in this research as a federal employee, a study team member will ask the participant to confirm they are off duty or on leave status in accordance with US Code Title 5, Section 6382. It will be the responsibility of the study participant to provide accurate information regarding their leave status at the appropriate compensation intervals. Upon request, the PI and/or authorized study team member may provide certification for intermittent leave, or leave on a reduced leave schedule, for planned study medical treatment(s) (in accordance with US Code Title 5, Section 6383).

13.3 Please describe the pre-screening process. If no pre-screening, enter Not Applicable in the text editor

This study has two screening phases: (1) Pre-screening based on initial inclusion/exclusion criteria (before informed consent), and (2) a formal screening phase to determine eligibility for randomization to intervention arm (after informed consent).

Pre-Screening (before consent):
If a potential participant expresses interest in learning more about the research study, a member of the research staff will briefly introduce the study, express the voluntary nature of participation, assess interest in participating, and screen the potential participant for eligibility. Eligibility will be determined in person using the Inclusion/Exclusion CRF (Appendix A). Individuals who do not meet Inclusion/Exclusion criteria will be encouraged to continue to seek care with their primary care provider and/or direct access at physical therapy.

Pre-screening conversations may also take place over the phone using the Screening Script (Appendix M). Potential participants who meet initial eligibility per the Screening Script and express interest in participating will be asked to come to clinic to complete an Inclusion/Exclusion CRF to confirm final eligibility with an authorized study team member prior to providing informed consent.

If the potential participant meets eligibility criteria as determined by the Inclusion/Exclusion CRF and expresses interest in participating, an authorized study team member will initiate the formal consent discussion and, if applicable, obtain informed consent. See protocol section 13.4 for additional information on the consent process.

Formal Screening (post-consent):
As part of the formal screening procedures, all consented participants that are biological females of child-bearing age and capacity will be required to complete a urine hCG pregnancy test. If the pregnancy test is positive, per the inclusion/exclusion criteria, the participant will be formally withdrawn from the study at this point, and will be encouraged to seek care with their primary care physician. If the pregnancy test is negative, the participant will be eligible to be randomized to a study arm and continue with the study procedures.

13.4 Consent Process: Revised Common Rule, Section 219.116: General requirements for informed consent, whether written or oral, are set forth in this paragraph and apply to consent obtained in accordance with the requirements set forth in paragraphs (b) through (d) of this section. Broad consent may be obtained in lieu of informed consent obtained in accordance with paragraphs (b) and (c) of this section only with respect to the storage, maintenance, and secondary research uses of identifiable private information and identifiable biospecimens.

Are you requesting a waiver or alteration of informed consent?

○ Yes ◉ No

Please explain the consent process:

Consent will be obtained in accordance with principles of Belmont Report and Common Rule guidelines.

The consent form will describe the purpose of the study, the procedures to be followed, and the risks and benefits of participation. A copy of the signed consent form will be given to the participant and the original will be stored in a locked cabinet inside of a locked office within the Podiatry Clinic. Documentation of consent will be recorded in the participant's medical record. No Legally Authorized Representatives will be utilized.

Formal consent, as represented by the act of signing a dated, IRB approved consent statement for the study will only occur after confirming eligibility using the Inclusion/Exclusion CRF, a thorough review of what is involved in the study, and after all questions have been answered. Potential participants will be provided information regarding all available study treatments and reminded of the expectations placed on them if they enroll, including the blinding and randomization processes.

The potential participant will be given a copy of the informed consent document to read before, during, and/or after discussion of the informed consent with the Research Coordinator, Principal Investigator, Associate Investigator, or other authorized study team member. Sufficient time will be given to the potential participant to understand the study purpose, study procedures, time commitments, potential risks and benefits, and the types of health information that will be accessed, collected, and used by the research team if they agree to participate in the study. Questions can be raised by the potential participant at any time during the consent discussion

and also at any time during the conduct of the study. The potential participant will be instructed that their participation is completely voluntary and that they may withdraw from the study at any time without penalty. Their decision to participate or to not participate, or to withdraw from the study after consent, will not affect their access to health care that they are otherwise entitled to and it will not affect their military position.

The authorized study team member present during the consent conversation will confirm that the potential participant has no additional questions before deciding to provide consent.

Every effort will be made to eliminate the perception of authority, which is a particularly important consideration when recruiting active-duty study participants. When applicable, the study investigators will be in scrubs or civilian clothes instead of uniform and will introduce themselves as doctor rather than their military rank. Some potential participants may be patients of the study PI or AI. In these cases, the consent conversation will be initiated by non-physician study staff to prevent any misconception of coercion or undue influence.

Informed consent and HIPAA authorization will be obtained in person.

In the event that there are significant new findings regarding the therapy that may affect participants' willingness to continue in the study, an information sheet will be provided to all current and past participants. The informed consent document will be amended for future participants.

Following completion of informed consent, the results of the Inclusion/Exclusion CRF will be entered into REDCap, an encrypted, access controlled, password protected electronic data capture and management system housed on a DoD server and maintained by the Uniformed Services University Information Technology (USU IT), and a unique study ID will be generated. This coded study ID will be used on all research data collection forms in place of the participant's name, Department of Defense (DoD) ID, or other protected identifier. No PII will be entered into REDCap. Please see Appendix R for additional information on REDCap.

13.5 DoDI 3216.02 requires an ombudsman to be present during recruitment briefings when research involves greater than minimal risk and recruitment of Service members occurs in a group setting. If applicable, you may nominate an individual to serve as the ombudsman.

- (●) N/A
- ( ) Propose ombudsman

13.6 Withdrawal from Study Participation:

Explain the process for withdrawal and specify whether or not the subjects will be given the opportunity to withdraw their data their data/specimens in the event they wish to withdraw from the study

Participant Withdrawal:
Participants may withdraw from the study at any time without penalty. Participants will be informed that withdrawal will not affect their access to health care that they are otherwise entitled to and it will not affect their military position.

If a participant withdraws from the study, we may retain and analyze all coded/de-identified data collected up to the time of withdrawal if the data is necessary to maintain the integrity of the study. However, no further data will be collected after the date of withdrawal.

Participants may contact the study research coordinator/assistant or Principal Investigator to formally withdraw from the study. Participants will be advised to follow-up with their personal physician if they choose to withdraw.

Withdrawal Without Participant Consent:
A participant may be withdrawn from the study without their consent if remaining in the study might be dangerous or harmful to them. Participation may also be stopped if the military mission requires it, if they lose their right to receive medical care at a military hospital, if the study is canceled, if they fail to adhere to the protocol and/or therapy plan, or if they display inappropriate behavior towards study personnel.

The reason for any withdrawal/removal will be documented.

14.0 Risks and Benefits

14.1 Risks of Harm:

Identify all research-related risks of harm to which the subject will be exposed for each research procedure or intervention as a result of participation in this study. Consider the risks of breach of confidentiality, psychological, legal, social, and economic risks as well as physical risks. Do not describe risks from standard care procedures; only describe risks from procedures done for research purposes

Research Procedure Name: Photobiomodulation (PBM) Therapy
Research Procedure Description: Light therapy for Plantar Fasciitis (PF)

The potential risks directly associated with study-specific activities and procedures are minimal. PBM treatment is used by a variety of healthcare practitioners for painful clinical conditions. Potential research-related risks include damage to eye structures and uncomfortable skin heating, which are both very rare.

Additionally, any time information is collected for a study, there is a small risk of breach of confidentiality.

14.2 Measures to Minimize Risks of Harm (Precautions, safeguards):

For each research procedure or intervention, describe all measures to minimize and/or eliminate risk of harms to subjects and study personnel

Protective eyewear will be worn by all participants and study team members during treatment sessions to avoid damaging their eyes.

All applicable study team members will complete a battery of training modules and hands-on training sessions to ensure safe operation of the PBMT device, and compliance with local laser safety requirements and American National Standards Institute (ANSI) standards Z136.1 (Safe Use of Lasers) and Z136.3 (Safe Use Lasers in Health Care). See Appendix K for the laser operator training plan.

A member of the research team will serve as a clinical laser safety officer (CLSO) to establish and manage the study-specific laser safety program. The designee will work with the MAMC Laser Safety Officer (LSO) and participate in the MAMC Laser Safety Committee (LSC) meetings quarterly to receive proper training. Along with the LSO and CLSO, the PI will ensure that the treatment space meets all regulatory requirements for utilization of a treatment laser, including appropriate signage and use of laser blocking screens to absorb any potential scatter/refraction of light outside of the treatment area.

In the rare occurrence that participants experience uncomfortable warmth over the treatment area, the treatment will be modified or stopped.

In order to protect participant confidentiality, research data will be identified using a unique study ID only, and not by participant name, date of birth, DoD ID, or other similar identifier. All available measures allowed by law will be taken by research staff to protect participant confidentiality. See protocol section 14.3 for additional information

All participants will be evaluated for adverse events at each follow-up visit. All adverse events, regardless of severity, will be reported to the Principal Investigator. Adverse events will also be reported according to the guidelines stated in Protocol Section 16.

14.3 Confidentiality Protections (for research records, data and/or specimens):

Describe in detail the plan to maintain confidentiality of the research data, specimens, and records throughout the study and at its conclusion (e.g., destruction, long term storage, or banking). Explain the plan for securing the data (e.g., use of passwords, encryption, secure servers, firewalls, and other appropriate methods). If data will be shared electronically with other team members/collaborators outside the institution, describe the method of transmission and safeguards to maintain confidentiality. Explain whether this study may collect information that State or Federal law requires to be reported to other officials or ethically requires action, e. g., child or spouse abuse

Upon consenting for the study, participants will be assigned a unique study ID. With the exception of the Informed Consent Form, HIPAA Authorization, and electronic Master List, all research data (both paper and electronic) will be identified using this unique study ID only, and not by the participant's name, date of birth, DoD ID, or other protected identifier.

Paper research forms and source documents will be stored in a locked cabinet inside of a locked room within the Podiatry Clinic, accessible only by local research staff designated and authorized by the Principal Investigator. The paper Intake CRF which records participant contact information, Informed Consent Forms and HIPAA Authorizations will be stored separately from the coded paper research forms in a locked cabinet inside of a locked room within the Podiatry Clinic, accessible only by authorized local research staff.

The coded electronic research data for this study will be stored in REDCap, an encrypted, access controlled, password protected electronic data capture and management system housed on a Department of Defense (DoD) server and maintained by the Uniformed Services University Information Technology (USU IT). No PHI/PII will be entered into REDCap or Teleray. See Appendix R for additional information on REDCap.

The local study team will maintain a separate electronic Master List which matches the unique study IDs with participant identifying information. The electronic Master List will be stored separately from the coded electronic research data in a secure, password-protected electronic document on a computer and network that requires CAC access.

All research data and forms (both paper and electronic) will only be accessible by authorized study staff, the IRB of record, the local research office, and applicable governmental agencies as part of their duties and in accordance with federal law (except as stated in the next paragraph). These duties include making sure that research participants are protected.

Musculoskeletal Injury Rehabilitation Research for Operational Readiness (MIRROR), which is based out of the Department of Physical Medicine & Rehabilitation (PM&R) at the Uniformed Services University (USU), is serving as the data coordinating center for this research study. As such, authorized staff from MIRROR/USU will have access to the coded research data that is entered into REDCap. Authorized staff from MIRROR/USU will not have access to the electronic Master List, the paper research records, or any participant PHI/PII.

There will be appropriate data sharing agreements in place.

Any research data shared with an approved agency for review will be linked only to the participant's unique study ID and not with the personal identity of the participant (i.e., name, DOB, DoD ID, address, phone number, etc.). If the research data is used in scholarly presentations or journal articles, the investigators will protect the anonymity of individual participants and report only aggregate data (e.g., group means) where appropriate. Participants will not be individually identified in any publication or presentation of research results.

14.4 Potential Benefits:

Describe any real and potential benefits of the research to the subject and any potential benefits to a specific community or society

If the individuals in the research are considered experimental subjects (per 10 USC 980), and they cannot provide their own consent, the protocol must describe the intent to directly benefit all subjects

We cannot guarantee that participants will benefit from participation in this research study. However, participants could experience relief of heel/foot pain and improved function, which may be accelerated for those in the PBMT group.

Additionally, information learned from their participation in this study may help individuals with PF in the future.

14.5 Privacy for Subjects:

Describe the measures to protect subject's privacy during recruitment, the consent process, and all research activities, etc.

Recruitment, consent conversations, and follow-up research activities will take place in a private setting (e.g., closed clinic room, investigator's office, etc.) to minimize the potential opportunity to be overheard or inadvertently witnessed. Information being collected will be limited to only the minimum amount of data necessary to accomplish the proposed research.

14.6 Incidental or Unexpected Findings:

Describe the plan to address incidental findings and unexpected findings about individuals from screening to the end of the subject's participation in the research. In cases where the subject could possibly benefit medically or otherwise from the information, state whether or not the results of screening, research participation, research tests, etc., will be shared with subjects or their primary care provider. State whether the researcher is obligated or mandated to report results to appropriate military or civilian authorities and explain the potential impact on the subject

There is the possibility incidental findings could reveal information the participant would not otherwise be aware of. In cases where the participant could possibly benefit medically or otherwise, the participant will be notified and, when appropriate, so will their primary care provider. Research representatives will not share incidental and unexpected findings with anyone else unless required by law.

In cases involving military personnel, information regarding their health may be required to be reported to appropriate medical or command authorities to ensure the proper execution of the military mission, including evaluation of fitness for duty.

Although unlikely, incidental findings could impact a participant's future ability to receive health or life insurance, as is the case with all medical care. Incidental findings may also make the participant feel anxious.

15.0 Study Monitoring

15.1 Your study requires either Data and Safety Monitoring Plan (DSMP) or a Data and Safety Monitoring Board (DSMB).

- (●) DSMP
- ( ) DSMB
- ( ) Both

Not Applicable

A DSMP should describe the plan to monitor the data to verify that the data are collected and analyzed as specified in the protocol. Include who will conduct the monitoring, what will be monitored, and the frequency of monitoring. It should also include the plan to ensure the safety of subjects

Participant Safety Monitoring Plan:
To ensure the safety of participants the PI will:

1. Monitor the conduct of the protocol per the approved study plan and ensure protection of human participants. This may involve periodic review of medical records and/or research files of enrolled participants.
2. Review and keep abreast of adverse events and protocol deviations that occur during the research.
3. Review and sign adverse event logs/reports, protocol deviation logs/reports, and continuing reviews/annual progress reports.
4. If there is concern about the welfare of enrolled participants, the PI will stop the research study in progress, remove individual participants from a study, and take whatever steps necessary to protect the safety and well-being of research participants until the IRB can assess the situation.
5. Ensure that all study team members keep current required human subjects research trainings which require renewal every 3 years.

If an adverse event or protocol deviation occurs, it will be evaluated by the Principal Investigator and appropriate actions will be taken as outlined in Section 16.0 Reportable Events. In the case of an emergency, first responders will be called. In order to address the challenge of early identification of an increased risk of a known adverse event, all adverse event data will be tracked and evaluated.

On-site physicians will monitor the progress and health of the participants alongside our Principal Investigator. Participants can elect to withdraw from the study at any time. Participants may also be taken out of the study at any point if a research provider (or one of their treating providers) determines that it is no longer safe for them to continue with the study. If a participant elects to drop out of the study or is withdrawn for safety reasons, they will resume standard of care treatment with their assigned health provider(s).

Data Monitoring Plan:
Data will be collected and stored in both paper CRF and electronic format as described previously in protocol section 10.14 Data Management. In addition to data quality and data validation checks done continually by REDCap for electronic format data, authorized MIRROR staff will perform routine checks of the coded electronic data entered into REDCap and Teleray to ensure that data has been properly input and that data entry is consistent with expected values. The local PI will ensure that paper research forms and the electronic Master List are completed and securely stored in accordance with stated protocol procedures.

Please see protocol Section. 14.3 Confidentiality Protections and 14.5 Privacy for Subjects for additional information regarding how we will protect participant privacy and confidentiality throughout this study.

16.0 Reportable Events

16.1 Reportable Events: Consult with the research office at your institution to ensure requirements are met. Describe plans for reporting unexpected adverse events and unanticipated problems. Address how unexpected adverse events will be identified, who will report, how often adverse events and unanticipated problems will be reviewed to determine if any changes to the protocol or consent form are needed and the scale that will be used to grade the severity of the adverse event.

Consult with the research office at your institution to ensure requirements are met

• Describe plans for reporting expected adverse events. Identify what the expected adverse events will be for this study, describe the likelihood (frequency, severity, reversibility, short-term management and any long-term implications of each expected event)

• Describe plans for reporting unexpected adverse events and unanticipated problems. Address how unexpected adverse events will be identified, who will report, how often adverse events and unanticipated problems will be reviewed to determine if any changes to the research protocol or consent form are needed and the scale that will be used to grade the severity of the adverse event

AEs/SAEs/UPIRTSOs:
The study overall is considered to be minimal risk for study participants, defined as not substantially above what would be encountered in everyday life including provision of routine medical care for the condition of plantar fasciitis. Potential risks are preventable by ensuring that appropriate and rigorous screening procedures are in place, and risk mitigation procedures (e.g., wearing appropriate eye protection) are utilized. Based on clinical use of this technology, and reports from other research studies, the risk of expected adverse events is low.

However, all reportable events, regardless of severity, will be reported to the Principal Investigator. The Principal Investigator will review all adverse events.

All Serious Adverse Events (SAEs) that are unexpected and related, or possibly related, to study participation will be reported to the IRB and Research Monitor via telephone or email within 24 hours of discovery and a complete written report via eIRB will follow within 5 business days.

Unanticipated Problems Involving Risks to Subjects or Others (UPIRTSOs) will be reported to the IRB via telephone or email within 24 hours of discovery and a complete written report via eIRB will follow within 5 business days.

Unexpected (but not serious) adverse events (AEs) occurring in subjects which, in the opinion of the PI, are related or possibly related to study participation AND places subjects or others at a greater risk of harm that was previously known or recognized in the protocol will be reported to the IRB via telephone or email within 24 hours of discovery and a complete written report via eIRB will follow within 5 business days.

Expected AEs/SAEs and AEs/SAEs that are not related or not possibly related to study participation will be tracked by the local study team using an Adverse Event Tracking Log and reported to the IRB at the time of continuing review or, if applicable, at study closure. Continuing Review (CR) Progress Reports are generally performed on a 12-month cycle. More frequent Progress Reports may be required at the discretion of the IRB.

Protocol Deviations:
All protocol deviations, both major and minor, will be reported to the Principal Investigator. The Principal Investigator will review all protocol deviations.

Major protocol deviations, as determined by the Principal Investigator, will be promptly reported to the IRB via telephone or email within 24 hours of discovery and a complete written report will follow within 5 working days.

Minor protocol deviations will be tracked by the local study team using a Protocol Deviation Log and reported to the IRB at the time of continuing review or, if applicable, at study closure. Follow up visits that occur outside of the windows stated in protocol will be considered minor protocol deviations.

17.0 Equipment/non-FDA Regulated Devices

17.1 Does the study involve the use of any unique non-medical devices/equipment?

○ Yes ◉ No

18.0 FDA-Regulated Products

18.1 Will any drugs, dietary supplements, biologics, or devices be utilized in this study?

- [ ] Drugs
- [ ] Dietary Supplements
- [ ] Biologics
- [x] Devices
- [ ] N/A

18.3 Device Details:

- [x] Are device(s) in this research being used in accordance to the approved labeling?
- [ ] Are device(s) in this research being used in a manner other than its approved labeling?

When adding a device indicate in the details section of the device if the use is either used in accordance to the approved labeling or in a manner other than it's approved labeling

View Details	Device Name
⊟	LightForce® XPi therapy laser

Manufacturer/Supplier of Device	LiteCure, DJO Global
Where will the Devices Be Stored	In the research area
Will Devices be supplied at no Cost	Yes
Is this a HUD (HDE)	No
HDE Number	N/A
Who holds the IDE	N/A
IDE details	N/A

18.4 Reporting Requirements for FDA-regulated research under IND and IDE:

Describe the process for complying with FDA regulatory requirements for adverse event reporting and adverse device effects reporting to the sponsor

The PI will be responsible for reporting any unanticipated adverse effects and unanticipated problems to the FDA in accordance with abbreviated IDE requirements for NSR devices.

18.5 Sponsor (organization/institution/company):

- [x] N/A

If applicable, provide sponsor contact information:

19.0 Research Registration Requirements

19.1 ClinicalTrials.gov Registration:

- ○ Registration is not required
- ◉ Registration pending
- ○ Registration complete

19.2 Defense Technical Information Center Registration (Optional):

- (•) Registration is not required
- ( ) Registration pending
- ( ) Registration complete

20.0 References and Glossary

20.1 References:

1. Scher DL, Belmont PJ, Jr., Bear R, Mountcastle SB, Orr JD, Owens BD. The incidence of plantar fasciitis in the United States military. The Journal of bone and joint surgery American volume. 2009;91(12):2867-72.
2. Dyck DD, Jr., Boyajian-O'Neill LA. Plantar fasciitis. Clinical journal of sport medicine: official journal of the Canadian Academy of Sport Medicine. 2004;14(5):305-9.
3. Rosenbaum AJ, DiPreta JA, Misener D. Plantar heel pain. The Medical clinics of North America. 2014;98(2):339-52.
4. DiGiovanni BF, Nawoczenski DA, Lintal ME, Moore EA, Murray JC, Wilding GE, et al. Tissue-specific plantar fascia-stretching exercise enhances outcomes in patients with chronic heel pain. A prospective, randomized study. The Journal of bone and joint surgery American volume. 2003;85-a(7):1270-7.
5. Schwartz EN, Su J. Plantar fasciitis: a concise review. The Permanente journal. 2014;18 (1):e105-7.
6. Franceschi F, Papalia R, Paciotti M, Franceschetti E, Di Martino A, Maffulli N, et al. Obesity as a risk factor for tendinopathy: a systematic review. International journal of endocrinology. 2014;2014:670262.
7. Roy TC. Diagnoses and mechanisms of musculoskeletal injuries in an infantry brigade combat team deployed to Afghanistan evaluated by the brigade physical therapist. Military medicine. 2011;176(8):903-8.
8. Roy TC, Knapik JJ, Ritland BM, Murphy N, Sharp MA. Risk factors for musculoskeletal injuries for soldiers deployed to Afghanistan. Aviation, space, and environmental medicine. 2012;83(11):1060-6.
9. Cameron KL, Owens BD. The burden and management of sports-related musculoskeletal injuries and conditions within the US military. Clinics in sports medicine. 2014;33(4):573-89.
10. Lemont H, Ammirati KM, Usen N. Plantar fasciitis: a degenerative process (fasciosis) without inflammation. Journal of the American Podiatric Medical Association. 2003;93(3): 234-7.
11. Orchard J. Plantar fasciitis. BMJ (Clinical research ed). 2012;345:e6603.
12. Franceschi F, Papalia R, Franceschetti E, Paciotti M, Maffulli N, Denaro V. Platelet-rich plasma injections for chronic plantar fasciopathy: a systematic review. British medical bulletin. 2014;112(1):83-95.
13. Hammer WI. The effect of mechanical load on degenerated soft tissue. Journal of bodywork and movement therapies. 2008;12(3):246-56.
14. Tountas AA, Fornasier VL. Operative treatment of subcalcaneal pain. Clinical orthopaedics and related research. 1996(332):170-8.
15. Miller LE, Latt DL. Chronic Plantar Fasciitis is Mediated by Local Hemodynamics: Implications for Emerging Therapies. North American journal of medical sciences. 2015;7 (1):1-5.
16. Jones BH, Canham-Chervak M, Canada S, Mitchener TA, Moore S. Medical surveillance of injuries in the U.S. Military descriptive epidemiology and recommendations for improvement. American journal of preventive medicine. 2010;38(1 Suppl):S42-60.
17. Canyilmaz E, Canyilmaz F, Aynaci O, Colak F, Serdar L, Uslu GH, et al. Prospective Randomized Comparison of the Effectiveness of Radiation Therapy and Local Steroid Injection for the Treatment of Plantar Fasciitis. International journal of radiation oncology, biology, physics. 2015;92(3):659-66.
18. Rompe JD. Plantar fasciopathy. Sports medicine and arthroscopy review. 2009;17(2):100-4.
19. Anders JJ, Lanzafame RJ, Arany PR. Low-level light/laser therapy versus photobiomodulation therapy. Photomedicine and laser surgery. 2015;33(4):183-4.
20. Chung H, Dai T, Sharma SK, Huang YY, Carroll JD, Hamblin MR. The nuts and bolts of low-level laser (light) therapy. Annals of biomedical engineering. 2012;40(2):516-33.

21. Alghadir A, Omar MT, Al-Askar AB, Al-Muteri NK. Effect of low-level laser therapy in patients with chronic knee osteoarthritis: a single-blinded randomized clinical study. Lasers in medical science. 2014;29(2):749-55.
22. Chow RT, Johnson MI, Lopes-Martins RA, Bjordal JM. Efficacy of low-level laser therapy in the management of neck pain: a systematic review and meta-analysis of randomised placebo or active-treatment controlled trials. Lancet. 2009;374(9705):1897-908.
23. Tumilty S, McDonough S, Hurley DA, Baxter GD. Clinical effectiveness of low-level laser therapy as an adjunct to eccentric exercise for the treatment of Achilles' tendinopathy: a randomized controlled trial. Archives of physical medicine and rehabilitation. 2012;93(5): 733-9.
24. Tumilty S, Munn J, Abbott JH, McDonough S, Hurley DA, Baxter GD. Laser therapy in the treatment of achilles tendinopathy: a pilot study. Photomedicine and laser surgery. 2008; 26(1):25-30.
25. Tumilty S, Munn J, McDonough S, Hurley DA, Basford JR, Baxter GD. Low level laser treatment of tendinopathy: a systematic review with meta-analysis. Photomedicine and laser surgery. 2010;28(1):3-16.
26. Haslerud S, Magnussen LH, Joensen J, Lopes-Martins RA, Bjordal JM. The efficacy of low-level laser therapy for shoulder tendinopathy: a systematic review and meta-analysis of randomized controlled trials. Physiotherapy research international: the journal for researchers and clinicians in physical therapy. 2015;20(2):108-25.
27. Oliveira FS, Pinfildi CE, Parizoto NA, Liebano RE, Bossini PS, Garcia EB, et al. Effect of low level laser therapy (830 nm) with different therapy regimes on the process of tissue repair in partial lesion calcaneous tendon. Lasers in surgery and medicine. 2009;41(4): 271-6.
28. Ng GY, Fung DT. The combined treatment effects of therapeutic laser and exercise on tendon repair. Photomedicine and laser surgery. 2008;26(2):137-41.
29. Basford JR, Malanga GA, Krause DA, Harmsen WS. A randomized controlled evaluation of low-intensity laser therapy: plantar fasciitis. Archives of physical medicine and rehabilitation. 1998;79(3):249-54.
30. Jastifer JR, Catena F, Doty JF, Stevens F, Coughlin MJ. Low-Level Laser Therapy for the Treatment of Chronic Plantar Fasciitis: A Prospective Study. Foot & ankle international. 2014;35(6):566-71.
31. Macias DM, Coughlin MJ, Zang K, Stevens FR, Jastifer JR, Doty JF. Low-Level Laser Therapy at 635 nm for Treatment of Chronic Plantar Fasciitis: A Placebo-Controlled, Randomized Study. The Journal of foot and ankle surgery: official publication of the American College of Foot and Ankle Surgeons. 2015;54(5):768-72.
32. Martin RL, Irrgang JJ, Burdett RG, Conti SF, Van Swearingen JM. Evidence of validity for the Foot and Ankle Ability Measure (FAAM). Foot & ankle international. 2005;26(11):968-83.
33. Buckenmaier CC, 3rd, Galloway KT, Polomano RC, McDuffie M, Kwon N, Gallagher RM. Preliminary validation of the Defense and Veterans Pain Rating Scale (DVPRS) in a military population. Pain medicine (Malden, Mass). 2013;14(1):110-23.
34. Nassif TH, Hull A, Holliday SB, Sullivan P, Sandbrink F. Concurrent Validity of the Defense and Veterans Pain Rating Scale in VA Outpatients. Pain medicine (Malden, Mass). 2015.
35. Tumilty S, Mani R, Baxter GD. Photobiomodulation and eccentric exercise for Achilles tendinopathy: a randomized controlled trial. Lasers Med Sci. 2016 Jan;31(1):127-35. doi: 10.1007/s10103-015-1840-4. Epub 2015 Nov 26. PMID: 26610637.
36. Redberg RF. Sham controls in medical device trials. N Engl J Med. 2014 Sep 4;371(10): 892-3. doi: 10.1056/NEJMp1406388. PMID: 25184861.

20.2 Abbreviations and Acronyms:

Activities of Daily Living (ADL)
Adverse Event (AE)
Body Mass Index (BMI)
Case Report Form (CRF)
Common Terminology Criteria for Adverse Events (CTCAE)
Continuing Review (CR)
Cytochrome C oxidase (CCO)
Date of Birth (DOB)
Department of Pathology and Area Laboratory Services (DPALS)
Defense and Veterans Pain Rating Scale (DVPRS)
Defense Health Agency (DHA)
Department of Defense (DoD)
Electronic Medical Record (EMR)
Foot and Ankle Ability Measure (FAAM)
Human chorionic gonadotropin (hCG)

Health Insurance Portability and Accountability Act (HIPAA)
Institutional Review Board (IRB)
Light-emitting diode (LED)
Madigan Army Medical Center (MAMC)
Musculoskeletal Injury Rehabilitation Research for Operational Readiness (MIRROR)
Nanometer (nm)
Public Affairs Office (PAO)
Photobiomodulation (PBM)
Photobiomodulation Therapy (PBMT)
Physical Medicine & Rehabilitation (PM&R)
Plantar fasciitis (PF)
Principal Investigator (PI)
Research Coordinator (RC)
Research Electronic Data Capture (REDCap)
Secure Sockets Layer (SSL)
Serious Adverse Event (SAE)
Transport Layer Security (TLS)
Ultraviolet (UV)
Unanticipated Problems Involving Risks to Subjects or Others (UPIRTSO)
Uniformed Services University (USU)
Uniformed Services University Information Technology (USU IT)
Usual care (UC)