

AWARD NUMBER: W81XWH-21-1-0501

TITLE: Regenerative Peripheral Nerve Interfaces to Treat Painful Digit and Hand Neuromas After Amputation: A Randomized, Prospective Study

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Fort Detrick, Maryland 21702-5012

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REPORT DOCUMENTATION PAGE

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				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Medstar Union Memorial Hospital The Curtis National Hand Center 201 East University Parkway, JBP 2 nd Floor Baltimore, MD 21218 Michigan Medicine- University of Michigan 1500 E. Medical Center Dr, 2130 Taubman Ann Arbor, MI, 48109				8. PERFORMING ORGANIZATION REPORT NUMBER	
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13. SUPPLEMENTARY NOTES					
14. ABSTRACT This study investigates the surgical treatment of painful neuromas in finger or partial hand amputation patients through the use of Regenerative Peripheral Nerve Interfaces (RPNI). Patients are given the option of RPNI surgery or standard of care surgery (traction neurectomy) after careful discussion with their provider. The primary objectives of this project are to use RPNI following excision of finger or hand neuromas to significantly reduce the experience of post-amputation pain, opioid dependence, and associated limitations in health and function as compared to control surgery. To date 7 subjects have been enrolled and 3 subjects have completed participation.					
15. SUBJECT TERMS Tissue Regeneration Therapeutic, Regenerative Peripheral Nerve Interfaces, RPNI, Neuroma, post-amputation pain, hand trauma. return to duty, quality of life					
16. SECURITY CLASSIFICATION OF: Unclassified		17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON USAMRDC	

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1. INTRODUCTION: *Narrative that briefly (one paragraph) describes the subject, purpose and scope of the research.*

This project addresses a novel "Tissue Regeneration Therapeutic" (focus area) by investigating the use of Regenerative Peripheral Nerve Interfaces (RPNI) to treat painful and functionally debilitating neuromas following finger and partial hand amputations. RPNI leverage the physiology of nerve and muscle tissue to decrease postamputation pain and optimize the restoration of traumatically injured extremities. Furthermore, the RPNI is a surgical intervention that facilitates rehabilitation and functional recovery by mitigating post-amputation pain after hand trauma and therefore promotes efficient return to duty of injured Service members, providing a unique approach to addressing "Retention Strategies" (focus area). The overall goal of implementing RPNI after hand trauma is to improve pain management, enhance functional recovery, minimize patients' dependence on pain medications (particularly opioids), and improve overall health and quality of life to comprehensively facilitate return to duty or service. Findings from this observational study will have direct applicability to active military Service members, Veterans, and the general public.

2. KEYWORDS: *Provide a brief list of keywords (limit to 20 words).*

Tissue Regeneration Therapeutic, Regenerative Peripheral Nerve Interfaces, RPNI, Neuroma, post-amputation pain, hand trauma. return to duty, quality of life

3. ACCOMPLISHMENTS: *The PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency grants official whenever there are significant changes in the project or its direction.*

What were the major goals of the project?

List the major goals of the project as stated in the approved SOW. If the application listed milestones/target dates for important activities or phases of the project, identify these dates and show actual completion dates or the percentage of completion.

Statement of Work for previous Randomized Control Trial design;

		Approx. % Complete
Specific Aim #1: Demonstrate the effectiveness of RPNI surgery in treating symptomatic neuromas of the digits and hand following amputation compared to standard of care using a prospective, randomized trial.		
Major Task 1 - Determine effectiveness of <u>treating</u> pain from existing finger or hand neuroma with RPNI surgery.		
Subtask 1:	IRB Documentation Generation: Obtain all necessary IRB documentation and provide to Government (HRPO) in accordance with IRB documentation submission guidance prior to conducting human studies.	1-3 Complete
Subtask 2:	Refine eligibility criteria, exclusion criteria, screening protocol, validation of rating scales, history & physical data, coding patient data, and methods for storing and accessing data.	1-3 Complete

Subtask 3:	Determine and implement metrics to assess effectiveness of RPNI after neuroma excision. Quantify post-surgery pain and functional activity using clinically driven metrics and standardized assessments. Ensure compliance forms, rating scales, recording forms, database establishment, coding is and administration is standardized.	1-3	Complete
Subtask 4:	Acquire heart rate and blood pressure monitors, build study team on EliteHRV app, test system and measurements	1-3	Complete
Subtask 5:	Recruitment of Study Participants via mail, telephone, and direct contact after Human Research Protection Office (HRPO) final approval. Target Enrollment: 80 total participants. All pre-operative testing will be completed after enrollment and prior to surgery (subtask 6 and 7).	6-40	3%
Subtask 6:	Complete RPNI surgeries (Target N = 40) including neuroma excision and implantation of RPNIs.	6-42	5%
Subtask 7:	Complete Non-RPNI (control, traction neurectomy) surgeries (Target N = 40).	6-42	2%
Subtask 8:	Evaluate surgical outcomes including PROMs, functional testing, and performance metrics for participants at 1 week, 1 month, 3 months and 6 months post-surgery per protocol.	6-48	2%
Subtask 9:	Evaluate cardiovascular data and analyze results throughout the study	6-48	Data collection ongoing
Subtask 10:	Collect and review medication logs, and check state databases, for prescriptions related to pain management	9-48	In Progress
Subtask 11:	Perform early, intermediate, and final analyses comparing outcomes and pain medication use between RPNI and control groups	9-48	Not Started
Subtask 12:	Submit amendments, adverse events, and protocol deviations as needed.	6-48	Not applicable currently
Milestone(s) Achieved:	Experimental Description Documentation. A full and detailed disclosure of all experimental procedures, which will include patient recruitment, patient consent, surgical procedures, measurement procedures, exclusion criteria, data-analysis procedures.	3	Complete
Milestone Achieved:	HRPO Approval	6	Complete
Milestone(s) Achieved:	Program for data management is in place. Facilitate anonymous subject data sharing including, but not limited to, descriptive data both raw and processed demographic data, surgical notes and outcomes, other records, and enough description for a third party to view.	6	Complete

Milestone Achieved:	RPNI surgery performed in 6 participants through year 1, 20 participants by end of year 2, 34 participants by end of year 3, and 40 by 6 months into year 4.	12,24, 36,42	5%
Milestone Achieved:	Non-RPNI (control) surgery performed in 6 participants in year 1, 20 participants by end of year 2, 34 participants through year 3, and 40 by 6 months into year 4.	12,24, 36,42	2%
Milestone(s) Achieved:	Deliver summary of clinical patient outcomes when performing RPNI surgery to treat painful neuromas.	48	Not started

Revised Statement of Work based on protocol design change to a Prospective Observational trial design:

		Approx. % Complete
Specific Aim #1: Demonstrate the effectiveness of RPNI surgery in treating symptomatic neuromas of the digits and hand following amputation compared to standard of care using a prospective, observational trial.		
Major Task 1 - Determine effectiveness of <u>treating</u> pain from existing finger or hand neuroma with RPNI surgery.		
Subtask 1: IRB Documentation Generation: Obtain all necessary IRB documentation and provide to Government (HRPO) in accordance with IRB documentation submission guidance prior to conducting human studies.	1-3	Complete
Subtask 2: Refine eligibility criteria, exclusion criteria, screening protocol, validation of rating scales, history & physical data, coding patient data, and methods for storing and accessing data.	1-3	Complete
Subtask 3: Determine and implement metrics to assess effectiveness of RPNI after neuroma excision. Quantify post-surgery pain and functional activity using clinically driven metrics and standardized assessments. Ensure compliance forms, rating scales, recording forms, database establishment, coding is and administration is standardized.	1-3	Complete
Subtask 4: Acquire heart rate and blood pressure monitors, build study team on EliteHRV app, test system and measurements	1-3	Complete
Subtask 5: Recruitment of Study Participants via mail, telephone, and direct contact after Human Research Protection Office (HRPO) final approval. Target Enrollment: 80 total participants. All pre-operative testing will be completed after enrollment and prior to surgery (subtask 6 and 7).	6-40	3%
Subtask 6: Complete neuroma surgeries (Target N = 80) including Traction Neurectomies and implantation of RPNIs.	6-42	7%

Subtask 7:	Evaluate surgical outcomes including PROMs, functional testing, and performance metrics for participants at 1 week, 1 month, 3 months and 6 months post-surgery per protocol.	6-48	4%
Subtask 8:	Evaluate cardiovascular data and analyze results throughout the study	6-48	Not Started
Subtask 9:	Collect and review medication logs, and check state databases, for prescriptions related to pain management	9-48	In Progress
Subtask 10:	Perform early, intermediate, and final analyses of outcomes and pain medication use in RPNI and Traction Neurectomy surgeries	9-48	Not Started
Subtask 11:	Submit protocol amendments, adverse events, and protocol deviations as needed.	6-48	Complete
Milestone(s) Achieved:	Experimental Description Documentation. A full and detailed disclosure of all experimental procedures, which will include patient recruitment, patient consent, surgical procedures, measurement procedures, exclusion criteria, data-analysis procedures.	3	Complete
Milestone Achieved:	HRPO Approval	6	Complete
Milestone(s) Achieved:	Program for data management is in place. Facilitate anonymous subject data sharing including, but not limited to, descriptive data both raw and processed demographic data, surgical notes and outcomes, other records, and enough description for a third party to view.	6	Complete
Milestone Achieved:	RPNI/Traction Neurectomy surgeries performed in 12 participants through year 1, 28 participants by end of year 2, 68 participants by end of year 3, and 80 by 6 months into year 4.	12,24, 36,42	7%
Milestone(s) Achieved:	Deliver summary of clinical patient outcomes when performing RPNI vs. Traction Neurectomy surgeries to treat painful neuromas.	48	Not started

What was accomplished under these goals?

For this reporting period describe: 1) major activities; 2) specific objectives; 3) significant results or key outcomes, including major findings, developments, or conclusions (both positive and negative); and/or 4) other achievements. Include a discussion of stated goals not met. Description shall include pertinent data and graphs in sufficient detail to explain any significant results achieved. A succinct description of the methodology used shall be provided. As the project progresses to completion, the emphasis in reporting in this section should shift from reporting activities to reporting accomplishments.

1. IRB Documentation Continuing Review: All necessary IRB documentation obtained and provided to Government (HRPO) in accordance with IRB documentation submission guidance for continuing conduct of human studies.

2. IRB Documentation Protocol Amendment: All necessary IRB documentation obtained and provided to Government (HRPO) in accordance with IRB documentation submission guidance for continuing conduct of human studies.
3. Across both sites 7 subjects have been enrolled, 3 have completed.
4. Tracking systems have been implemented at both performance sites to track potential subjects.
5. Data collection systems in place and working well across both sites, including cardiovascular physiology data.

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

If the project was not intended to provide training and professional development opportunities or there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe opportunities for training and professional development provided to anyone who worked on the project or anyone who was involved in the activities supported by the project. “Training” activities are those in which individuals with advanced professional skills and experience assist others in attaining greater proficiency. Training activities may include, for example, courses or one-on-one work with a mentor. “Professional development” activities result in increased knowledge or skill in one’s area of expertise and may include workshops, conferences, seminars, study groups, and individual study. Include participation in conferences, workshops, and seminars not listed under major activities.

As part of this study, we have educated numerous surgeons on the surgical technique for RPNI. This has included developing and disseminating a training PowerPoint and videos for the technique.

How were the results disseminated to communities of interest?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how the results were disseminated to communities of interest. Include any outreach activities that were undertaken to reach members of communities who are not usually aware of these project activities, for the purpose of enhancing public understanding and increasing interest in learning and careers in science, technology, and the humanities.

Nothing to Report

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

If this is the final report, state “Nothing to Report.”

Describe briefly what you plan to do during the next reporting period to accomplish the goals and objectives.

We have taken a broader approach to recruitment, working to spread news of this study across both MedStar Health and Michigan Medicine networks so that any and all eligible patients can know about this ongoing study. We have also provided study information to regional prosthetists and acupuncturists for possible referrals. Many neuroma patients have been told by other providers that there are no treatments or options, and we are hoping to reach some of them (and improve our recruitment numbers) with this broader effort.

Both sites have implemented tracking systems to follow amputation patients. EMR’s are reviewed 6 months post amputation for reports of post amputation pain. Patients without mention of pain in their EMR are contacted to query for any post amputation pain.

4. **IMPACT:** *Describe distinctive contributions, major accomplishments, innovations, successes, or any change in practice or behavior that has come about as a result of the project relative to:*

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

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how findings, results, techniques that were developed or extended, or other products from the project made an impact or are likely to make an impact on the base of knowledge, theory, and research in the principal disciplinary field(s) of the project. Summarize using language that an intelligent lay audience can understand (Scientific American style).

Nothing to report

What was the impact on other disciplines?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how the findings, results, or techniques that were developed or improved, or other products from the project made an impact or are likely to make an impact on other disciplines.

Nothing to Report

What was the impact on technology transfer?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe ways in which the project made an impact, or is likely to make an impact, on commercial technology or public use, including:

- *transfer of results to entities in government or industry;*
- *instances where the research has led to the initiation of a start-up company; or*
- *adoption of new practices.*

Nothing to Report

What was the impact on society beyond science and technology?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how results from the project made an impact, or are likely to make an impact, beyond the bounds of science, engineering, and the academic world on areas such as:

- *improving public knowledge, attitudes, skills, and abilities;*
- *changing behavior, practices, decision making, policies (including regulatory policies), or social actions; or*
- *improving social, economic, civic, or environmental conditions.*

Nothing to Report

5. CHANGES/PROBLEMS: *The PD/PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency grants official whenever there are significant changes in the project or its direction. If not previously reported in writing, provide the following additional information or state, "Nothing to Report," if applicable:*

Changes in approach and reasons for change

Describe any changes in approach during the reporting period and reasons for these changes. Remember that significant changes in objectives and scope require prior approval of the agency.

After careful discussion with the Department of Defense Scientific Officer regarding low recruitment numbers based on the number of eligible subjects declining to randomize it was decided that the best course of action to increase enrollment was to change the study design from a Prospective Randomized trial design to a Prospective Observational trial design allowing potential subjects to decide with their surgeon as to the best treatment of their condition and their lifestyle.

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

Describe problems or delays encountered during the reporting period and actions or plans to resolve them.

While enrollment is currently below goal, efforts have been made to disseminate study information to Orthopedic Surgeons/Plastic Surgeons/Hand Surgeons, Pain Management Specialists across the Medstar system and Michigan Medicine to boost enrollment. This includes outreach into the community and local referral networks, including prosthetists and acupuncturists across the geographic region where possible. As with many other trials we have had several eligible patients decline to participate in randomization and that has also impacted recruitment numbers thus far.

A protocol amendment changing the trial design from a prospective, randomized trial to a prospective, observational trial we submitted and approved by ADVARRA IRB and OHRO

Since implementing this change, we have enrolled 4 additional subjects at Curtis Hand and 2 potential subjects at University of Michigan have expressed interest in participating and are reviewing the current informed consent form. This has been a notable increase compared to year 1 and we believe this will continue with the new study approach.

Changes that had a significant impact on expenditures

Describe changes during the reporting period that may have had a significant impact on expenditures, for example, delays in hiring staff or favorable developments that enable meeting objectives at less cost than anticipated.

Nothing to Report

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

Describe significant deviations, unexpected outcomes, or changes in approved protocols for the use or care of human subjects, vertebrate animals, biohazards, and/or select agents during the reporting period. If required, were these changes approved by the applicable institution committee (or equivalent) and reported to the agency? Also specify the applicable Institutional Review Board/Institutional Animal Care and Use Committee approval dates.

Significant changes in use or care of human subjects

After discussion with the Department of Defense Scientific Officer for this award it was mutually agreed upon to change the study design from a Prospective Randomized trial design to a Prospective Observational trial design allowing potential subjects to decide with their surgeon as to the best treatment of their condition and their lifestyle. This amendment has been reviewed and approved by ADVARRA IRB and OHRO.

Significant changes in use or care of vertebrate animals

Nothing to Report

Significant changes in use of biohazards and/or select agents

Nothing to Report

6. PRODUCTS: *List any products resulting from the project during the reporting period. If there is nothing to report under a particular item, state “Nothing to Report.”*

- **Publications, conference papers, and presentations**

Report only the major publication(s) resulting from the work under this award.

Journal publications. *List peer-reviewed articles or papers appearing in scientific, technical, or professional journals. Identify for each publication: Author(s); title; journal; volume: year; page numbers; status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

Nothing to Report

Books or other non-periodical, one-time publications. *Report any book, monograph, dissertation, abstract, or the like published as or in a separate publication, rather than a periodical or series. Include any significant publication in the proceedings of a one-time conference or in the report of a one-time study, commission, or the like. Identify for each one-time publication: author(s); title; editor; title of collection, if applicable; bibliographic information; year; type of publication (e.g., book, thesis or dissertation); status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

Nothing to Report

Other publications, conference papers and presentations. *Identify any other publications, conference papers and/or presentations not reported above. Specify the status of the publication as noted above. List presentations made during the last year (international, national, local societies, military meetings, etc.). Use an asterisk (*) if presentation produced a manuscript.*

Nothing to Report

- **Website(s) or other Internet site(s)**

List the URL for any Internet site(s) that disseminates the results of the research activities. A short description of each site should be provided. It is not necessary to include the publications already specified above in this section.

Nothing to Report

- **Technologies or techniques**

Identify technologies or techniques that resulted from the research activities. Describe the technologies or techniques were shared.

Nothing to Report

- **Inventions, patent applications, and/or licenses**

Identify inventions, patent applications with date, and/or licenses that have resulted from the research. Submission of this information as part of an interim research performance progress report is not a substitute for any other invention reporting required under the terms and conditions of an award.

Nothing to Report

- **Other Products**

Identify any other reportable outcomes that were developed under this project. Reportable outcomes are defined as a research result that is or relates to a product, scientific advance, or research tool that makes a meaningful contribution toward the understanding, prevention, diagnosis, prognosis, treatment and /or rehabilitation of a disease, injury or condition, or to improve the quality of life. Examples include:

- *data or databases;*
- *physical collections;*
- *audio or video products;*
- *software;*
- *models;*
- *educational aids or curricula;*
- *instruments or equipment;*
- *research material (e.g., Germplasm; cell lines, DNA probes, animal models);*
- *clinical interventions;*
- *new business creation; and*
- *other.*

We have developed and disseminated a RPNI procedure PowerPoint presentation and surgical training video for surgeon training

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?

Provide the following information for: (1) PDs/PIs; and (2) each person who has worked at least one person month per year on the project during the reporting period, regardless of the source of compensation (a person month equals approximately 160 hours of effort). If information is unchanged from a previous submission, provide the name only and indicate “no change”.

Name: Aviram Giladi, MD, MS
Project Role: Principle Investigator
Researcher Identifier (e.g. ORCID ID): 0000-0001-7688-957X
Nearest person month worked: 2
Contribution to Project: No Change

Name: Theodore Kung, MD,
Project Role: Co- Investigator (University of Michigan)
Researcher Identifier (e.g. ORCID ID): 0000-0003-2418-8119
Nearest person month worked: 2
Contribution to Project: No Change

Name: Ike Fleming, CCRC
Project Role: Lead Study Coordinator/Program Manager
Researcher Identifier (e.g. ORCID ID): N/A
Nearest person month worked: 4
Contribution to Project: No Change

Name: Ashley Bartee
Project Role: Research Associate
Researcher Identifier (e.g. ORCID ID): N/A

Nearest person month worked: 4
Contribution to Project: No Change

Name: Jennifer Hamill
Project Role: Research Coordinator (University of Michigan)
Researcher Identifier (e.g. ORCID ID): N/A
Nearest person month worked: 2
Contribution to Project: No Change

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

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

If the active support has changed for the PD/PI(s) or senior/key personnel, then describe what the change has been. Changes may occur, for example, if a previously active grant has closed and/or if a previously pending grant is now active. Annotate this information so it is clear what has changed from the previous submission. Submission of other support information is not necessary for pending changes or for changes in the level of effort for active support reported previously. The awarding agency may require prior written approval if a change in active other support significantly impacts the effort on the project that is the subject of the project report.

Nothing to Report

What other organizations were involved as partners?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe partner organizations – academic institutions, other nonprofits, industrial or commercial firms, state or local governments, schools or school systems, or other organizations (foreign or domestic) – that were involved with the project. Partner organizations may have provided financial or in-kind support, supplied facilities or equipment, collaborated in the research, exchanged personnel, or otherwise contributed.

Provide the following information for each partnership:

Organization Name:

Location of Organization: (if foreign location list country)

Partner’s contribution to the project (identify one or more)

- *Financial support;*
- *In-kind support (e.g., partner makes software, computers, equipment, etc., available to project staff);*
- *Facilities (e.g., project staff use the partner’s facilities for project activities);*
- *Collaboration (e.g., partner’s staff work with project staff on the project);*
- *Personnel exchanges (e.g., project staff and/or partner’s staff use each other’s facilities, work at each other’s site); and*
- *Other.*

Organization Name: Michigan Medicine- University of Michigan
Location of Organization: 1500 E. Medical Center Dr, 2130 Taubman
Ann Arbor, MI, 48109
Partner’s contribution to the project: Collaborator

8. SPECIAL REPORTING REQUIREMENTS


COLLABORATIVE AWARDS: For collaborative awards, independent reports are required from BOTH the Initiating Principal Investigator (PI) and the Collaborating/Partnering PI. A duplicative report is acceptable; however, tasks shall be clearly marked with the responsible PI and research site. A report shall be submitted to <https://ebrap.org/eBRAP/public/index.htm> for each unique award.

QUAD CHARTS:

Regenerative Peripheral Nerve Interfaces (RPNIs) to Treat Painful Digit and Hand Neuromas after Amputation – A Prospective, Observational Trial

OR200127
W81XWH-20-PRORP-CTRA

PI: Aviram Giladi, MD, MS and Theodore Kung, MD **Org:** Curtis Hand Center/MedStar Health/U of Michigan **Award Amount:** \$1.5M

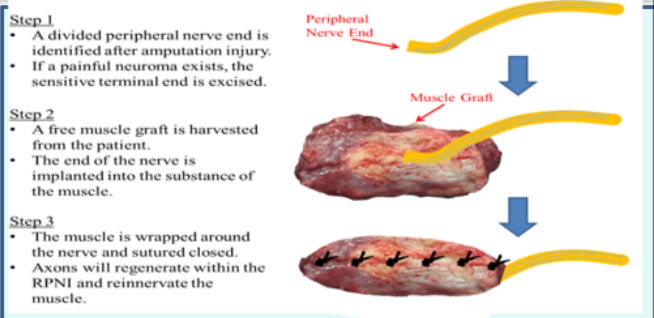


Study/Product Aim(s)

- **SA 1** – Demonstrate the effectiveness of RPNI surgery in treating symptomatic neuromas of the digits and hand following amputation compared to standard of care using a prospective, observational trial
- **SA 2** – Determine the improvements in hand function, upper extremity function, and ability to return to work or duty as a result of RPNI surgery.

Approach

This is a prospective, observational trial of patients with painful finger or hand neuromas after traumatic amputation, drawn from The Curtis National Hand Center and The University of Michigan. We will compare novel RPNI surgery to traction neurectomy, the current surgical standard of care. We will evaluate pain, mental and physical health, and opioid use. We will also test function, strength, motor skills, and composite work tasks to evaluate work/duty readiness.



Step 1

- A divided peripheral nerve end is identified after amputation injury.
- If a painful neuroma exists, the sensitive terminal end is excised.

Step 2

- A free muscle graft is harvested from the patient.
- The end of the nerve is implanted into the substance of the muscle.

Step 3

- The muscle is wrapped around the nerve and sutured closed.
- Axons will regenerate within the RPNI and reinnervate the muscle.

Figure demonstrating the novel RPNI surgical technique, providing a target for the terminal end of an injured nerve to properly regenerate and avoid neuroma recurrence

Accomplishment: Initial retrospective publication on 14 patients with finger/hand neuroma treated with total of 30 RPNI, notable reductions in pain and improvements in function

Timeline and Cost

Activities	CY	21	22	23	24
Prospectively Enroll Patients					
Perform surgery					
Evaluate pain and health outcomes					
Evaluate strength and function outcomes					
Estimated Budget (\$K)		\$450k	\$350k	\$325k	\$375k

Updated: 08/24/2023

Goals/Milestones

CY21 Goal – Project Start

- Obtain IRB/HRPO Approvals, Obtain HRV and Blood Pressure Monitors
- Begin Prospective Enrollment/ Randomization to Surgical Procedures
- Evaluate strength and function outcomes
- Continuing Review Obtained from IRB, Submitted to HRPO

CY22 Goals – continue to enroll for treatment of painful neuromas

- Enroll through 50% of target
- Evaluate strength and function outcomes

CY23 Goal – continue to enroll for treatment of painful neuromas

- Obtain Protocol design change approval from ADVARRA IRB
- Obtain Protocol design change approval from OHRO
- Enroll up to 80% of target
- Analyses of physiologic data, report preliminary findings

CY24 Goal – complete enrollment, revise and finalize analyses

- Complete enrollment
- Compare primary and secondary outcomes (SA1 & 2) across groups

Comments/Challenges/Issues/Concerns

- Enrollment difficulty with RCT even after expanded efforts; protocol amended to a prospective observational trial to aid recruitment

Budget Expenditure to Date

Projected Expenditure: \$1,500,000
Actual Expenditure: \$576,383.25

- 9. APPENDICES:** *Attach all appendices that contain information that supplements, clarifies or supports the text. Examples include original copies of journal articles, reprints of manuscripts and abstracts, a curriculum vitae, patent applications, study questionnaires, and surveys, etc.*
Nothing to report.