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**TITLE:** Translation, Implementation, and Evaluation of Best-Practice Burn First Aid in Prolonged Field Care and Prehospital Environments

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**CONTRACTING ORGANIZATION:** Griffith University, Nathan Campus, QLD, Australia

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# REPORT DOCUMENTATION PAGE

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<b>14. ABSTRACT</b> This research period covers the preparatory phase of the project. During this period the focus has been on reviewing and signing subaward contracts with participating partners; developing the research protocol; obtaining all relevant regulatory approvals; identifying, approaching, and engaging key emergency services; strategy development; and preparing support materials, like interview scripts and SOPs. The contracts have been reviewed, approved and signed; a final research protocol was developed; all regulatory approvals (IRB and HRPO) were obtained as per October 2022. A significant roadblock was encountered within Orange County, where a key decision maker could not be convinced of the intervention and no endorsement was provided. An alternative has been proposed to the DoD that adds the Emergency Department in Sacramento County to the previous pre-hospital component. Key emergency services from Sacramento County were engaged and an Australian site visit has been planned for October 2022; strategy development has been ongoing; and supporting implementation materials and documents have been developed. The Australian site visit will provide dynamic interdisciplinary and integrated care delivery experience and evidence to confidently start phase 2 of the project upon their return to the US.					
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## 1. INTRODUCTION

Current best-practice, evidence-based, first aid treatment for burns is defined as 20 minutes of cool running water (CRW) within the first three hours of burn injury. Adequate CRW delivered either consecutively or collectively significantly decreases burn depth, improves time to re-epithelialization, decreases the need for skin grafting and intensive care admission, and reduces long-term scarring sequelae, in addition to serving an analgesic function. The three-hour treatment window post-burn provides a limited opportunity where first responders can deliver treatment pre-hospital. Despite the significant benefits and relative ease of the intervention, its adoption in the pre-hospital setting remains challenging. We hypothesize that a co-designed, burn first-aid intervention implementation strategy (“TIER EFFECT”), will be acceptable, feasible, and adopted by first responders, ultimately significantly improve burn patient morbidity and outcomes.

## 2. KEYWORDS

Burn/s, first-responder, first-aid, pre-hospital, implementation science, prolonged field care, paramedicine, emergency care.

## 3. ACCOMPLISHMENTS

### a. What were the major goals of the project? (Goals to be accomplished and status.)

Specific Aim 1: Develop study protocol and obtain IRB and HRPO (months 1-10).

- Major Task 1: Prepare Regulatory Documents and Research Protocol for Study  
STATUS: regulatory docs (IRB and HRPO) reviewed and approved Y1Q4
- Major Task 2: Coordinate Study Staff and Preparation for Research Commencement
  - o STATUS: study staff assigned; roles defined Y1Q4

Specific Aim 2: Phase 1: Co-design TIER EFFECT Implementation Strategies (months 8-18).

- Major Task 1: Co-Design of TIER EFFECT Implementation Strategies and Materials
  - o STATUS: as yet to start Y2Q1

Specific Aim 3: Phase 2: Implementation intervention delivered to each of the sites defined by the Advisory Group (months 19-30).

- Major Task 1: Implementation of the TIER EFFECT implementation strategies
  - o STATUS: as yet to start Y2Q3

Specific Aim 4: Phase 3: Evaluation of Implementation Effectiveness (months 36-40).

- Major Task 1: Collect Health Data for patient outcomes and Cost Effectiveness
  - o STATUS: yet to start, Y3Q4
- Major Task 2: Data Analysis
  - o STATUS: yet to start, Y4Q1

Specific Aim 5: Phase 4: Sustainability planning and facilitation (months 47-48)

- Major Task 1: Design and develop a national rollout plan
  - o STATUS: yet to start, Y4Q4
- Major Task 2: Develop website for sharing resources
  - o STATUS: yet to start, Y4Q4

### b. What was accomplished under these goals? (Detailed progress and results.)

Primary Objective: to understand and strategically address contextual characteristics influencing the implementation of best practice burn first aid into US EMS environments

Secondary Objectives:

1. Develop national burn first-aid best practice guidelines
2. Design facilitated and adaptable implementation strategies to translate research evidence from guidelines into practice.

3. Evaluate the implementation process, adherence to TIER EFFECT interventions, and effects on patient outcomes.
4. Evaluate the cost-effectiveness of the TIER EFFECT interventions.
5. Synthesize learnings, develop recommendations and a master set of implementation strategies, and disseminate to national professional bodies, and state and county stakeholder organizations

### **Research protocol**

The research protocol has undergone several iterations, but ultimately a single research protocol was agreed upon by the UC Davis and the Griffith University research teams, which served as the basis for the regulatory applications. The Initial IRB application was approved in September 2022 and the subsequent HRPO approval was obtained early October 2022.

### **Regulatory processes**

The initial IRB application has been reviewed and approved. An amended protocol restricted to UC Davis has also been approved, since learning of UC Irvines inability to participate. The subsequent HRPO application has also been reviewed, minor comments were addressed, we anticipate approval in October 2022.

### **Partner engagement**

#### UC Davis

The partner engagement at UC Davis has been extraordinary. We were able to get in touch with the right people to assist in getting this project up and running. IRB approval has been obtained and HRPO application has been reviewed and responses to the reviewer's comments are currently being reviewed. Apart from people at UC Davis we have now been connected with key people within the Sacramento Fire Department, who are equally enthusiastic to participate in this project.

An Australian site visit has been organized for a delegation from the US burn centre and emergency service staff for the end of October as part of the preliminary strategic implementation discussions and witnessing the intervention across Queensland emergency services firsthand.

#### UC Irvine

Although the investigators at UC Irvine have been enthusiastic, during recent discussions a key decision maker was identified who could not be convinced of the intervention itself or its implementation across EMS in Orange County. Without his endorsement, UC Irvine is unable to participate in the project. We are in the process of requesting a modification and redirect the UC Irvine funding to support an extra protocol at UC Davis that includes the Emergency Department as a pivotal place to complete burn wound cooling if a full 20 minutes was not attained in the pre-hospital pathway or if patients were not transported by EMS.

### **Project promotion and support**

We are in the process of launching a website, which will support the project by providing background information, team introductions and a survey section for voluntary participation from EMS staff. Similarly, awareness of the project will be achieved by distributing promotional materials at participating emergency services. During recent discussions, social media was also mentioned as a way to deliver key information about the intervention to the public and emergency response staff.

### **Key Findings or Accomplishments:**

- Research protocol developed
- Regulatory approvals (IRB and HRPO) obtained
- Emergency service engagement and commitment established
- Research support staff identified and roles defined
- Australian site visit planned to experience embedded intervention in first aid environment
- Burn first aid evidence reviewed and published (2022)
- Project implementation strategy development commenced
- Online research survey developed
- First barrier to implementation encountered (UC Irvine)

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

Nothing to report

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

Nothing to report

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

The preparation phase of the project has now been concluded and the subsequent co-design phase is about to commence. There have been several strategic discussions to support the new phase and the Australian site visit is set to finalize these discussions and prepare a suitable implementation strategy and process leading up to the third or implementation phase. To raise awareness of the intervention, some promotional materials have been developed and produced to be distributed to launch the participating sites onboarding. A social media strategy promoting 20CRW has also been discussed to extend the reach of awareness of the project.

The roadblock encountered in Orange County, that prevents UC Irvine from participating, has prompted a proposal for an alternative protocol discussed with our DoD science officer (Robyn Walker and Sandy Snyder, 29 September 2022). The protocol change has been forwarded to Robert Doan (contract specialist from USA MRAA-GB4). The change details a plan of expanding the existing pre-hospital protocol and adding the Emergency Department at UC Davis, extending the opportunity of 20CRW intervention across the care spectrum. This protocol would allow supplementation of the intervention of patients who have had insufficient burn wound cooling before their transport or of ambulatory patients who present at the Emergency Department and have had no burn wound cooling.

**4. IMPACT**

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

Nothing to report

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

Nothing to report

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

Nothing to report

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

Nothing to report

**5. CHANGES/PROBLEMS**

**a. Changes in approach and reasons for change**

The uncompromising position of and lack of endorsement from a key emergency services decision maker in Orange County prohibited our continuation of proposed works in UC Irvine. Barriers experienced at Orange County have been an important learning point for the project moving forward.

Adapting as a result of the Orange County roadblock in Orange County we propose a secondary protocol that would expand our reach across the entire emergency care pathway for burns (pre-hospital and the ED). In addition to the original protocol that focuses on the pre-hospital burn first aid standards, the secondary protocol proposes to implement the intervention in the Emergency Department at UC Davis. This protocol would allow for the intervention of cool running water to be completed in the ED if the full 20 minutes was not achieved prior to arrival to the burn center. Additionally, ambulatory burn victims that present at the ED on their own accord, can still receive 20 minutes of cool running water in the ED.

As there is only a situational difference between the original protocol (pre-hospital) and the newly proposed protocol (In-hospital), we expect the regulatory approvals to be expedited and project to commence shortly thereafter. This alternative protocol is fully supported by existing relationships (Cis Kuppermann and Palmieri) and connections with the UC Davis ED.

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

See above

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

Nothing to report

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

Nothing to report

**6. PRODUCTS**

**a. Journal publications**

Griffin B, Cabilan CJ, Ayoub B, Xu HG, Palmieri T, Kimble R, Singer Y. The effect of 20 minutes of cool running water first aid within three hours of thermal burn injury on patient outcomes: A systematic review and meta-analysis. *Australas Emerg Care.* 2022 Dec;25(4):367-376. doi: 10.1016/j.auec.2022.05.004. Epub 2022 Jun 7. Pubmed PMID: 35688782.

- a. Systematic Literature Review
- b. Published
- c. Directly related to SOW, specific aim
- d. DoD funding not acknowledged as work on review mostly took place prior to DoD funding

**b. Books or other non-periodical, one-time publications**

Nothing to report

**c. Other publications, conference papers, and presentations**

Nothing to report

**d. Website(s) or other Internet site(s)**

A website to support the project is currently being developed. It provides background information and evidence of the intervention of wound cooling, an overview of the research team, the sponsors and a section for participants to voluntarily complete surveys. The aim is to prepare the website to outlast the project duration and account for expansion and potential changes down the track.

**e. Technologies or techniques**

Nothing to report

**f. Inventions, patent applications, and/or licenses**

Nothing to report

**g. Other Products**

Nothing to report

## 7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

### a. What individuals have worked on the project?

Name: A/Prof. Bronwyn Griffin  
Project Role: Lead PI  
Researcher Identifier:  
Nearest person month worked: 7 months  
Contribution to Project: Write and develop research protocol, prepare regulatory documents, develop SOPs, management frameworks, draft website content and layout, liaise with investigators, organize meetings, manage budgets and prepare reporting and general oversight.

Name: Dr. Peter Poortvliet  
Project Role: Clinical Research Coordinator  
Researcher Identifier:  
Nearest person month worked: 6 months  
Contribution to Project: Write and develop research protocol, prepare regulatory documents, develop SOPs, management frameworks, draft website content and layout, liaise with investigators, organize meetings, manage budgets and prepare reporting.

Name: Prof. Tina Palmieri  
Project Role: PI  
Researcher Identifier:  
Nearest person month worked: 1 month  
Contribution to Project: Provide strategic advice, review research protocols, identify support staff

Name: Prof. John Rose  
Project Role: PI  
Researcher Identifier:  
Nearest person month worked: 1 month  
Contribution to Project: Provide strategic advice, review research protocols, identify support staff, connect with EMS locations for participation

Name: Ms. Yvonne Singer  
Project Role: AI  
Researcher Identifier:  
Nearest person month worked: 2 months  
Contribution to Project: Development of data collection instruments, attend regular meetings, contributions to research articles.

Name: Ms. Mary Beth Lawless  
Project Role: AI  
Researcher Identifier:  
Nearest person month worked: 2 months  
Contribution to Project: Prepare regulatory applications, attend weekly meetings and provide advice and feedback.

Name: Ms. Michaela Canova  
Project Role: AI  
Researcher Identifier:  
Nearest person month worked: 1 month  
Contribution to Project: Prepare regulatory applications, attend weekly meetings and provide advice and feedback

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

Apart from the alternative proposal considering the roadblock encountered in Orange County, there is no change.

- c. What other organizations were involved as partners?**

Nothing to report

**8. SPECIAL REPORTING REQUIREMENTS  
QUAD CHART**

**9. APPENDICES**