AWARD NUMBER: W81XWH-22-2-0092

TITLE: Evaluation of Burn Shock Utilizing Compensatory Reserve Measurement: A Prospective Clinical Study

PRINCIPAL INVESTIGATOR: MAJ Amanda Wiggins, MD

CONTRACTING ORGANIZATION: The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc.

REPORT DATE: October 2023

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Development Command
Fort Detrick, Maryland 21702-5012

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
October 2023	Annual	30SEPT2022 - 29SEPT2023

4. TITLE AND SUBTITLE

Evaluation of Burn Shock Utilizing Compensatory Reserve Measurement: A Prospective Clinical Study

5a. CONTRACT NUMBER
W81XWH-22-2-0092

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
MAJ Amanda Wiggins. MD

E-Mail: amanda.r.wiggins.mil@health.mil

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc.

US Army institute for
surgical research, Burn ICU
3551 Roger Brooke Dr
Fort Sam Houston, Tx 78234

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

U.S. Army Medical Research and Development Command
Fort Detrick, Maryland 21702-5012

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for Public Release; Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

Burns occur in 5-10% of combat casualties and are projected to be even more common during multi-domain operations against a peer or near-peer adversary. Furthermore, the initial resuscitation of patients in burn shock takes 24 - 48 hours to complete, is fraught with life- and limb-threatening complications such as compartment syndromes and demands the attention of experienced personnel to execute successfully. Thus, burn-shock resuscitation by medics during prolonged field care will be both highly likely and challenging. Resuscitation of patients burns and other injuries (e.g. traumatic brain injury, pulmonary contusion, amputations) introduce new management trade-offs that in turn increase the difficulty of the task. In response, better ways to monitor burn-shock casualties and to guide their resuscitation are needed for the battlefield. This proposal will evaluate a novel technology, the compensatory reserve measurement (CRM), in patients undergoing active burn-shock resuscitation with or without concomitant traumatic injuries. This prospective observational study of CRM in seriously burned adults will be the first of its kind.

15. SUBJECT TERMS
NONE LISTED

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			USAMRDC
U	U	U	UU	9	19b. TELEPHONE NUMBER *(include area code)*

TABLE OF CONTENTS

1. INTRODUCTION:

Burns occur in 5-10% of combat casualties and are projected to be even more common during multi-domain operations against a peer or near-peer adversary. Furthermore, the initial resuscitation of patients in burn shock takes 24 - 48 hours to complete, is fraught with life- and limb-threatening complications such as compartment syndromes and demands the attention of experienced personnel to execute successfully. Thus, burn-shock resuscitation by medics during prolonged field care will be both highly likely and challenging. Resuscitation of patients burns and other injuries (e.g. traumatic brain injury, pulmonary contusion, amputations) introduce new management trade-offs that in turn increase the difficulty of the task. In response, better ways to monitor burn-shock casualties and to guide their resuscitation are needed for the battlefield. This proposal will evaluate a novel technology, the compensatory reserve measurement (CRM), in patients undergoing active burn-shock resuscitation with or without concomitant traumatic injuries. This prospective observational study of CRM in seriously burned adults will be the first of its kind.

2. KEYWORDS:

Compensatory Reserve measurement, burn shock, resuscitation, trauma, arterial lines, prolonged field care.

3. ACCOMPLISHMENTS:

What were the major goals of the project?

1. To determine whether CRM decreases during burn shock, and the timing of such decreases in relationship to other indices of shock (to include urine output, blood pressure, heart rate, base deficit, lactate, and the infusion of vasoactive medications to support blood pressure).
2. To determine whether CRM increases in response to the resuscitative effort, and the timing of such increases in relationship to other indices of shock.
3. In a preplanned subgroup analysis, to document differences in CRM between those with thermal injury alone, and those with both thermal injury and concomitant non-thermal trauma (to include inhalation injury, traumatic brain injury, major torso/extremity trauma, and myocardial dysfunction/infarction).

What was accomplished under these goals?

Since this study is not yet enrolling, no progress has been made towards the goals.

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

Nothing to report.

How were the results disseminated to communities of interest?

Nothing to report.

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

Finalize software and begin enrolling in the study.

4. **IMPACT:**

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

Nothing to report.

What was the impact on other disciplines?

Nothing to report

What was the impact on technology transfer?

Nothing to report.

What was the impact on society beyond science and technology?

Nothing to report

5. CHANGES/PROBLEMS:

Nothing to report

Changes in approach and reasons for change

Nothing to report.

Changes that had a significant impact on expenditures

There have been delays in software and hardware compatibility and have therefore prevented the study from initiating enrollment.

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

Significant changes in use or care of human subjects

Nothing to report.

Significant changes in use or care of vertebrate animals

Nothing to report.

Significant changes in use of biohazards and/or select agents

Nothing to report.

6. PRODUCTS:

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

Journal publications.

Nothing to report.

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

Nothing to report.

Other publications, conference papers and presentations.

Nothing to report.

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

Nothing to report.

- **Technologies or techniques**

Nothing to report.

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

Nothing to report.

- **Other Products**

Nothing to report.

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?

Name: Amanda Wiggins, MD
Project Role: PI
Nearest person month worked: 2.0
Research Identifier: unknown
Contribution to project: Dr. Wiggins is involved in study design, and data analysis, oversee data collection/storage and consenting process; evaluate study consistently for improvements and potential amendments; coordinate all team efforts to ensure study is operating efficiently; finalize all regulatory documents; data interpretation, abstract and manuscript submission.

Name: Leopoldo Cancio, MD
Project Role: AI
Nearest person month worked: 1.0
Research Identifier: unknown
Contribution to project: Study design and data analysis; assess patient/subject eligibility; provide clinical feedback about the project for potential improvements; data interpretation, abstract and manuscript submission.

Name: Maria Serio-Melvin
Project Role: AI
Nearest person month worked: 1.0
Research identifier: unknown
Contribution to project: Study design and data analysis

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

PI has changed from Dr. Britton to Dr. Wiggins. Otherwise, nothing to report.

What other organizations were involved as partners?

Nothing to report.

8. SPECIAL REPORTING REQUIREMENTS

COLLABORATIVE AWARDS: *None*

QUAD CHARTS: See attached.

9. APPENDICES:

PHS Inclusion Enrollment Report.