MEMORANDUM FOR SGST
ATTN: LT COL JACQUELINE KILLIAN

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled **The Impact of a Novel Biobehavioral Intervention on Physiologic State, Perceived Stress and Affect** presented at **Uniformed Services University Research Day May 25 2016** with MDWI 41-108, and has been assigned local file #16160.

2. Pertinent biographic information (name of author(s), title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.

3. Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are 59 MDW staff member, we can forward your request for funds to the designated wing POC.

4. Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

   [Signature]

   LINDA STEEL-GOODWIN, Col, USAF, BSC
   Director, Clinical Investigations & Research Support

Warrior Medics – Mission Ready – Patient Focused
TO: CLINICAL RESEARCH

FROM: (Author's Name, Rank, Grade, Office Symbol)
Jacqueline Killian, Lt Col, O5, 59MDW/ST

GME/GHSE STUDENT: ☐ YES ☑ NO

PROTOCOL NUMBER: USU-TO-61-3105

PROTOCOL TITLE: (NOTE: For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.)
A Biobehavioral Intervention's Impact on Physiologic State, Perceived Stress and Affect

TITLE OF MATERIAL TO BE PUBLISHED OR PRESENTED:
The Impact of a Novel Biobehavioral Intervention on Physiologic State, Perceived Stress and Affect

FUNDING RECEIVED FOR THIS STUDY? ☑ YES ☐ NO FUNDING SOURCE: Jonas Scholars Grant & USUHS

DO YOU NEED FUNDING SUPPORT FOR PUBLICATION PURPOSES? ☐ YES ☑ NO

IS THIS MATERIAL CLASSIFIED? ☐ YES ☑ NO

IS THIS MATERIAL SUBJECT TO ANY LEGAL RESTRICTIONS FOR PUBLICATION OR PRESENTATION THROUGH A COLLABORATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA), MATERIAL TRANSFER AGREEMENT (MTA), INTELLECTUAL PROPERTY RIGHTS AGREEMENT ETC.? ☑ YES ☐ NO

NOTE: If the answer is YES then attach a copy of the Agreement to the Publications/Presentations Request Form.

MATERIAL IS FOR: ☑ DOMESTIC RELEASE ☐ FOREIGN RELEASE

CHECK APPROPRIATE BOX OR BOXES FOR APPROVAL WITH THIS REQUEST. ATTACH COPY OF MATERIAL TO BE PUBLISHED/PRESENTED.

☑ 11a. PUBLICATION/JOURNAL (List intended publication/journal.)

☐ 11b. PUBLISHED ABSTRACT (List intended journal.)

☐ 11c. POSTER (To be demonstrated at meeting; name of meeting, city, state, and date of meeting.)
Uniformed Services University Research Day May 25, 2016

☐ 11d. PLATFORM PRESENTATION (At civilian institutions: name of meeting, state, and date of meeting.)

☐ 11e. OTHER (Describe: name of meeting, city, state, and date of meeting.)

EXPECTED DATE WHEN YOU WILL NEED THE CRD TO SUBMIT YOUR CLEARED PRESENTATION/PUBLICATION TO DTIC

NOTE: All publications/presentations are required to be placed in the Defense Technical Information Center (DTIC).

DATE: April 06, 2016

59 MDW PRIMARY POINT OF CONTACT (Last Name, First Name, M.I., email)
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DUTY PHONE/PAGER NUMBER 292-3059

AUTHORSHIP AND CO-AUTHOR(S) List in the order they will appear in the manuscript.

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a. Primary/Corresponding Author
Jacqueline Killian O-5/Lt Col 59 MDW/ST

b.
c.
d.
e.
f.

I CERTIFY ANY HUMAN OR ANIMAL RESEARCH RELATED STUDIES WERE APPROVED AND PERFORMED IN STRICT ACCORDANCE WITH 32 CFR 219, AFMAN 40-401_IP, AND 59 MDW 41-108. I HAVE READ THE FINAL VERSION OF THE ATTACHED MATERIAL AND CERTIFY THAT IT IS AN ACCURATE MANUSCRIPT FOR PUBLICATION AND/OR PRESENTATION.

AUTHOR'S PRINTED NAME, RANK, GRADE
Jacqueline Killian Lt Col/ O5

APPROVING AUTHORITY'S PRINTED NAME, RANK, TITLE
Brenda J. Morgan, Col, USAF, NC
**Processing of Professional Medical Research/Technical Publications/Presentations**

1st Endorsement (59 MDW/SGVU Use Only)

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24. DATE REVIEWED 7 Apr 2016

25. DATE FORWARD TO 502 ISG/JAC

26. AUTHOR CONTACTED FOR RECOMMENDED OR NECESSARY CHANGES: ☑ NO ☐ YES If yes, give date. ☐ N/A

27. COMMENTS: ☑ APPROVED ☐ DISAPPROVED
The poster is approved.

28. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER
Rocky Calcote, PhD, Clinical Research Administrator

29. REVIEWER SIGNATURE
CALCOTE ROCKY D 1178245844

30. DATE

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32. DATE FORWARD TO 59 MDWI/PA

33. COMMENTS ☐ APPROVED (In compliance with security and policy review directives.) ☐ DISAPPROVED

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38. DATE FORWARD TO 59 MDW/SGVU
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40. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER
Michael Ellis, SSgt, 59 MDW PA

41. REVIEWER SIGNATURE
ELLIS MICHAEL ALLEN 10465568
42. DATE
April 15, 2016

4th Endorsement (59 MDW/SGVU Use Only)

43. DATE RECEIVED

44. SENIOR AUTHOR NOTIFIED BY PHONE OF APPROVAL OR DISAPPROVAL
☐ YES ☐ NO ☐ COULD NOT BE REACHED ☐ LEFT MESSAGE

45. COMMENTS ☐ APPROVED ☐ DISAPPROVED

46. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER

47. REVIEWER SIGNATURE

48. DATE
The Impact of a Novel Biobehavioral Intervention on Physiologic State, Perceived Stress and Affect

Lt Col Jacqueline Killian, 59 MDW/ST, JBSA-Lackland

*Daniel K. Inouye Graduate School Of Nursing, Uniformed Services University of the Health Sciences, Bethesda, MD

MILITARY SIGNIFICANCE

As a result of over 15 years of war, members of the military services have experienced unprecedented consequences related to the stresses of serving during this time. Early detection, characterization, and treatment of stress-related disorders is one of the highest priorities for the armed forces and military medical research, as a means of force health protection. One complementary intervention, laughter yoga, has yet to be investigated in a military population but is a promising treatment for stress related disorders.

BACKGROUND

- Significant health problems associated with chronic stress include: heart disease, cancer, asthma, and gastrointestinal disturbances.
- Physiologic response to stress involves a cascade of complex internal systems.
- Cardiovascular and respiratory systems are complementary and reciprocal, providing continual modulation to maintain balance.
- Individuals resilient to stress have been shown to return to homeostasis more quickly, activating their sympathetic nervous system (SNS) to respond more efficiently while mitigating the damaging effects of allostatic load.
- Heart rate variability (HRV) is a means of measuring autonomic nervous system response.
- Respiratory system response to stress = respiratory rate and tidal volume
- Slower respiratory rate with larger tidal volumes stimulate the vagus nerve, which activates the SNS
- LY involves physical exercise and breath work that stimulates the vagus impacting sympathetic parasympathetic balance and increases oxygen which is known to aid in healing and improving energy levels to aid in stress management.

PURPOSE

The search for innovative, non-invasive and cost-effective means of mitigating the effects of stress is the basis of this pilot study.

Purpose: To explore the use of LY as a method to mitigate the physiologic effects of stress and begin to identify the protective factors associated with resilience in a military student population.

METHODS

Design: Quasi-experimental pre/post-test wait-listed control group

RESULTS

- Independent sample and paired t-tests were performed for between groups and within group comparison for physiologic measures along with Friedman's two-way analysis of variance by rank with pairwise comparison with Bonferroni correction for multiple comparisons over six time points.
- Mann-Whitney U were performed for between group comparison and Wilcoxon Signed Rank for within groups comparison of change scores calculated from self-report scores.
- Independent thematic analysis of verbal responses to open ended questions (accomplished by five research team members).

IMPLICATIONS

Results of this pilot study contribute to the growing body of evidence regarding the physiologic and psychological impact of LY participation. Changes observed in HRV measures and PEF suggest that participation in LY may provide an alternative aerobic activity that can assist in reducing stress while improving respiratory status. Whereas increases in positive affect, mental health and resilience scores, as well as participant open responses indicate further research is needed to determine whether continued participation would result in progressive changes that could promote resilience in military members.

Table 3. Results of between group comparison Mann-Whitney U analyses. Significant findings are reported in Table 2.

Table 4. Results of Friedman’s Single-Rank analyses. Significant findings are reported in Table 2.

Disclaimer: The opinions expressed herein are those of the author, and are not necessarily representative of those of the Uniformed Services University of the Health Sciences (USUHS), the Department of Defense (DoD), or the United States Army, Navy or Air Force.
• Significant health problems associated with chronic stress include: heart disease, cancer, asthma, and gastrointestinal disturbances.
• Physiologic response to stress involves a cascade of complex internal multiasystem actions.
• Cardiovascular and respiratory systems are complementary and reciprocal, providing continual modulation to maintain allostatics.
• Individuals resilient to stress have been shown to return to allostatics more quickly, activating their sympathetic nervous system to respond more efficiently while mitigating the damaging effects of allostatic load.
• Heart rate variability (HRV) is a means of measuring autonomic nervous system response. Decreased variability signifies activation of the sympathetic nervous system potentially caused by acute or chronic stress.
• Increased variability denotes increased vagal tone and activation of the parasympathetic nervous system.
• The respiratory system response to stress is characterized by increased respiratory rate and decreased tidal volume, whereas slower respiratory rate with larger tidal volumes stimulate the vagus nerve, which activates the parasympathetic nervous system.
• LY involves physical exercise and breath work that stimulates the vagus impacting sympathetic parasympathetic balance and increases oxygen which is known to aid in healing and improving energy levels to aid in stress management.
• Significant health problems associated with chronic stress include: heart disease, cancer, asthma, and gastrointestinal disturbances.
• Physiologic response to stress involves a cascade of complex internal multiasystem actions.
• Cardiovascular and respiratory systems are complementary and reciprocal, providing continual modulation to maintain allostatics.
• Individuals resilient to stress have been shown to return to allostatics more quickly, activating their sympathetic nervous system (SNS) to respond more efficiently while mitigating the damaging effects of allostatic load.
• Heart rate variability (HRV) is a means of measuring autonomic nervous system response.

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\text{variability} = \frac{\text{vagal tone/parasympathetic nervous system activation (PNS)}}{\text{respiratory system response to stress = respiratory rate and tidal volume}}
\]
• Respiratory system response to stress = respiratory rate and tidal volume
• Slower respiratory rate with larger tidal volumes stimulate the vagus nerve, which activates the PNS
• LY involves physical exercise and breath work that stimulates the vagus impacting sympathetic parasympathetic balance and increases oxygen which is known to aid in healing and improving energy levels to aid in stress management.