MEMORANDUM FOR SGVT

ATTN: CAPT MARIYA GUSMAN

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled **Occupational Hazards of Flying Pigs: A Swine Model of Hypobaric-Induced Neuronal Injury** presented at/published to **American Society of Neuroradiology, Long Beach CA, 22-27 April 2017** in accordance with MDW1 41-108, has been approved and assigned local file #17204.

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 a 59 MDW staff member, we can forward your request for funds to the designated Wing POC at the Chief Scientist’s Office, Ms. Alice Houy, office phone: 210-292-8029; email address: alice.houy.civ@mail.mil.

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.

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

**Warrior Medics – Mission Ready – Patient Focused**
USE ONLY THE MOST CURRENT 59 MDW FORM 3039 LOCATED ON AF E-PUBLISHING

INSTRUCTIONS

1. The author must complete page two of this form:
   a. In Section 2, add the funding source for your study (e.g., 59 MDW CRD Graduate Health Sciences Education (GHSE) GDP; BGS R&D; TIS Service Nursing Research Program (TISNR); Defense Medical Research & Development Program (DMRDP); NIH; Congressionally Directed Medical Research Program (CDMRP); Grants; etc.)
   b. In Section 2, there may be funding available for journal costs, if your department is not paying for figures, tables or photographs for your publication. Please state "YES" or "NO" in Section 2 of the form, if you need publication funding support.

2. Print your name, rank/grade, sign and date the form in the author's signature block or use an electronic signature.

3. Attach a copy of the 59 MDW IRB or IACUC approval letter for the research related study. If this is a technical publication/presentation, state the type (e.g. case report, QAPI study, program evaluation study, informational report/briefing, etc.) in the "Protocol Title" box.

4. Attach a copy of your abstract, paper, poster and other supporting documentation.

5. Save and forward, via email, the processing form and all supporting documentation to your unit commander, program director or immediate supervisor for review/approval.

6. On page 2, have either your unit commander, program director or immediate supervisor:
   a. Print their name, rank/grade, title, sign and date the form in the approving authority's signature block or use an electronic signature.

7. Submit your completed form and all supporting documentation to the CRD for processing (59crdustrps@us.af.mil). This should be accomplished no later than 30 days before final clearance is required to publish/present your materials. If you have any questions or concerns, please contact the 59 CRD/Publications and Presentations Section at 232-7141 for assistance.

8. The 59 CRD/Publications and Presentations Section will route the request form to clinical investigations, 502 B/NG/AC (Ethics Review) and Public Affairs (59 MDW/PA) for review and then forward you a final letter of approval or disapproval.

9. Once your manuscript, poster or presentation has been approved for a one-time public release, you may proceed with your publication or presentation submission activities, as stated on this form. 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.

10. If your manuscript is accepted for scientific publication, please contact the 59 CRD/Publications and Presentations Section at 232-7141. This Information is reported to the 59 MDW/OC. All medical research or technical Information publications/presentations must be reported to the Defense Technical Information Center (DTIC). See 59 MDW 41-108, Presentation and Publication of Medical and Technical Papers, for additional information.

11. The Joint Ethics Regulation (JER) DoD 5500.07-R, Standards of Conduct, provides standards of ethical conduct for all DoD personnel and their interactions with other non-DoD entities, organizations, societies, conferences, etc. Part of the Form 3039 review and approval process includes a legal ethics review to address any potential conflicts related to DoD personnel participating in non-DoD sponsored conferences, professional meetings, publication/presentation disclosures to domestic and foreign audiences, DoD personnel accepting non-DoD contributions, awards, honors, gifts, etc. The specific circumstances for your presentation will determine whether a legal review is necessary. If you (as the author) or your supervisor check "NO" in block 17 of the Form 3039, your research or technical documents will not be forwarded to the 502 B/NG/AC legal office for an ethics review. To assist you in making this decision about whether to request a legal review, the following examples are provided as a guideline:

   For presentations before professional societies and like organizations, the 59 MDW Public Affairs Office (PAO) will provide the needed review to ensure proper disclaimers are included and the subject matter of the presentation does not create any cause for DoD concern.

   If the sponsor of a conference or meeting is a DoD entity, an ethics review of your presentation is not required, since the DoD entity is responsible to obtain all approvals for the event.

   If the sponsor of a conference or meeting is a non-DoD commercial entity or an entity seeking to do business with the government, then your presentation should have an ethics review.

   If your travel is being paid for (in whole or in part) by a non-Federal entity (someone other than the government), a legal ethics review is needed. These requests for legal review should come through the 59 MDW Gifts and Grants Office to 502 B/NG/AC.

   If you are receiving an honorarium or payment for speaking, a legal ethics review is required.

   If you (as the author) or your supervisor check "YES" in block 17 of the Form 3039, your research or technical documents will be forwarded simultaneously to the 502 B/NG/AC legal office and PAO for review to help reduce turn-around time. If you have any questions regarding legal reviews, please contact the legal office at (202) 671-5755/3365, DSN 473.

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement:

"The views expressed are those of the [author(s)] [presenter(s)] and do not reflect the official views or policy of the Department of Defense or its Components"

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving humans:

"The voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and DoD 3216.02_AFI 40-402."

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving animals, as required by ARMAN 40-401 LIP:

"The experiments reported herein were conducted according to the principles set forth in the National Institute of Health Publication No. 85-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended."
**Processing of Professional Medical Research/Technical Publications/Presentations**

<table>
<thead>
<tr>
<th>TO: CLINICAL RESEARCH</th>
<th>FROM: (Author's Name, Rank, Grade, Office Symbol)</th>
<th>GM/E/SHSE STUDENT</th>
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<tr>
<td></td>
<td>Mariya Gusman, Capt, O3, SGVT</td>
<td>X YES</td>
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5. 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.)

Brain MRI and serological effects of hypobaric exposure to 30,000 ft. and hyperoxemic exposure at sea level in a sus scrofa domestic model.

6. TITLE OF MATERIAL TO BE PUBLISHED OR PRESENTED:

Occupational Hazards of Flying Pigs: A Swine Model of Hypobaric-Induced Neuronal Injury.

7. FUNDING RECEIVED FOR THIS STUDY? X YES [NO]

Funding Source: JPCS

8. DO YOU NEED FUNDING SUPPORT FOR PUBLICATION PURPOSES? [YES] [NO]

9. IS THIS MATERIAL CLASSIFIED? [YES] [NO]

10. 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.

11. MATERIAL IS FOR: [DOMESTIC RELEASE] [FOREIGN RELEASE]

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

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

   b. PUBLISHED ABSTRACT (List intended journal)

   c. POSTER (To be demonstrated at meeting: name of meeting, city, state, and date of meeting)

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

American Society of Neuroradiology, Long Beach, California, April 22-27, 2017

12. HAVE YOUR ATTACHED RESEARCH/TECHNICAL MATERIALS BEEN PREVIOUSLY APPROVED TO BE PUBLISHED/PRESENTED? [YES] [NO]

   ASSIGNED FILE # approved through 711HPW DATE

13. EXPECTED DATE WHEN YOU WILL NEED THE CORD 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 07, 2017

14. 59 MDW PRIMARY POINT OF CONTACT (Last Name, First Name, M.I., email)

    Quintero, Susan J. susanj.quintero.civ@mail.mil

15. DUTY PHONE/PAGER NUMBER

    210-292-5290

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

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<th>LAST NAME, FIRST NAME AND M.I.</th>
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17. IS A 502 IGJ/JAC ETHICS REVIEW REQUIRED (JER DOD 5500.7-R)? [YES] [NO]

   CERTIFY ANY HUMAN OR ANIMAL RESEARCH RELATED STUDIES WERE APPROVED AND PERFORMED IN STRICT ACCORDANCE WITH 32 CFR 219, AFMAN 40-401/JP, AND 59 MDW 41-159. I HAVE READ THE FINAL VERSION OF THE ATTACHED MATERIAL AND CERTIFY THAT IT IS AN ACCURATE MANUSCRIPT FOR PUBLICATION AND/OR PRESENTATION.

18. AUTHOR'S PRINTED NAME, RANK, GRADE

    Mariya Guzman, Capt, O3

19. AUTHOR'S SIGNATURE

    GUZMAN MARIYA. 13064423179

21. APPROVING AUTHORITY'S PRINTED NAME, RANK, TITLE

    Christian L. Carlson, LTC, O5

22. APPROVING AUTHORITY'S SIGNATURE

    CARLSON CHRISTIAN LIEUTENANT COLONEL
### Processing of Professional Medical Research/Technical Publications/Presentations

**1st Endorsement (59 MDW/SG/VO Use Only)**

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26. Date Reviewed: 17 April 2017

28. Author Contacted for Recommended or Necessary Changes: [ ] No [ ] Yes [ ] Other

29. Comments: [ ] Approved [ ] Disapproved

30. Printed Name, Rank/Grade, Title of Reviewer: Anneke C. Bush, GS-14, Clinical Research Administrator

31. Reviewer Signature: BUSH, ANNEKE C. 10429603260

32. Date: 17 April 2017

**2nd Endorsement (592 IG/JAC Use Only)**

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35. Comments: [ ] Approved (In compliance with security and policy review directives) [ ] Disapproved

**3rd Endorsement (58 MDW/PA Use Only)**

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41. Comments: [ ] Approved (In compliance with security and policy review directives) [ ] Disapproved

Please add disclaimer to your presentation.

"The Views expressed are those of the [author(s)] [presenter(s)] and do not reflect the official views or policy of the Department of Defense or its Components"

Once added, presentations are approved and cleared for public release by Public Affairs.

**42. Printed Name, Rank/Grade, Title of Reviewer**

Kevin Imuma, SSgt/E-5, 59MDW Public Affairs

43. Reviewer Signature: IMUMA, KEVIN; MTSU0713227

44. Date: April 17, 2017

**4th Endorsement (58 MDW/SGU Use Only)**

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<td>[ ] Yes [ ] No [ ] Could Not Be Reached [ ] Left Message</td>
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47. Comments: [ ] Approved [ ] Disapproved

**56. Date Received**

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<th>49.Reviewer Signature</th>
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50. Date:
OCCUPATIONAL HAZARDS OF FLYING PIGS: A SWINE MODEL OF HYPOBARIC-INDUCED NEURONAL INJURY

Mariya Gusman, MD1; Jeremy Bernot, MD1; Paul Sherman, MD2,3

1Department of Radiology, 59th Medical Wing, Joint Base San Antonio - Lackland, TX
2U.S. Air Force School of Aerospace Medicine, Aeromedical Research Department, Wright-Patterson AFB, OH
3Department of Neuroradiology, 59th Medical Wing, Joint Base San Antonio - Lackland, TX

PURPOSE: Human exposure to non-hypoxic hypobaria is associated with increased white matter hyperintensities, degradation of axonal integrity, and neurocognitive processing decrements. We looked to develop an animal model for axonal cerebral injury following non-hypoxic hypobaric exposure utilizing magnetic resonance (MR) diffusion tensor imaging, Q-space, and advanced diffusion kurtosis imaging.

MATERIALS AND METHODS: Utilizing a revised/improved hypobaric exposure protocol that no longer necessitates intubation or anesthetization of exposure subjects, miniature pigs (Sus scrofa domestica) were repetitively exposed to non-hypoxic hypobaria at 30,000 feet. Controls remained at 5,000 feet altitude. MR imaging was obtained at baseline, immediately post-exposure, and 4-weeks post-exposure. Advanced diffusion quantification was used to include kurtosis anisotropy, multi-b-value diffusion (Q-space), and fractional anisotropy (FA). Two-tailed t-tests were used for individual and group comparisons.

RESULTS: Perfusion-diffusion index and mean kurtosis anisotropy revealed an increase in unrestricted water immediately after repetitive high-altitude exposures. In addition, age-adjusted average FA significantly decreased at 4 weeks post-exposure in the high-altitude group compared to controls (p <0.001/0.547).

CONCLUSION: Perfusion-diffusion index and kurtosis demonstrate an increase in unrestricted water after repetitive hypobaric exposure, consistent with injury. The significant decrease in FA at 4 weeks suggests degradation of axonal integrity. This replicates similar MR imaging findings in humans. The study provides evidence that repetitive hypobaric exposure incites axonal damage, and that swine may be a feasible animal model with which to improve our understanding of injury mechanisms and potentially test interventions that could reduce hypobaric neuronal injury.

The Views expressed are those of the [author[s]) [presenter[s]) and do not reflect the official views or policy of the Department of Defense or its Components.