CALL SIGNS

APRIL **2024**
Call Signs Vol 11, Issue 1

USN AEP SOCIETY

A Publication of the United States Naval Aerospace Experimental Psychology Society

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FROM THE PRESIDENT

Greetings! Thank you for taking interest in this issue of *Call Signs*, the official publication of the United States Naval Aerospace Experimental Psychology Society. In naval aviation, call signs distinguish individual aircraft and aviators during radio communications (identification); they support fast-paced operations, demanding clear and concise communications (efficiency); and they provide a source of pride and unit identity (cohesion and morale). *Call Signs* serves these same general functions, while also addressing the core goals of our Society:

- **Informing Readers**: *Call Signs* keeps our readers informed of the latest advancements in the knowledge, science, tools, and practices of aviation psychology.
- **Professional Development**: *Call Signs* fosters the professional development of aeromedical scientists and practitioners.
- **Strengthening Bonds**: *Call Signs* strengthens both professional and fraternal ties among our members.

Additionally, *Call Signs* plays a crucial role in introducing future Naval Aerospace Experimental Psychologists to our community of wing-wearing scientists and opportunities to serve in uniform. In this issue, we address a common question asked by candidate AEPs during job fairs and interviews: *What would be expected of me in my first duty assignment?* To answer this, we've curated a collection of articles authored by first-tour AEPs. These articles delve into the projects and responsibilities associated with their initial billets.

Highlights from this issue include LT Sarah Beadle's insights into M-LOSA, a program that observes everyday maintenance tasks of squadrons to identify common threats and errors in order to improve safety and identify areas for improvement; LT Xan Kaplan's observations on why some Naval aviators avoid drinking fluids to limit bath-

room breaks (tactical dehydration), despite impacts on performance and health; and LT Kaila Vento's research on sex-based differences in hypoxia experiences, with women aviators exhibiting lower oxygen saturation and increased likelihood to report headaches during hypoxic events. LT Vento is also featured in the cover photo of this issue of *Call Signs*, taken during her winging ceremony as AEP #169.

On behalf of the newly elected USNAEPS executive committee, I hope you enjoy this issue of *Call Signs*. Collectively, we look forward to executing the Society's mission and serving your needs as best we can.

- President, CDR Brennan "Tip" Cox
- Vice President, LCDR Sarah "Sunshine" Melick
- Secretary, LT Kaila "Wizzle" Vento
- Treasurer, LCDR Nick "Terror" Armendariz
- Editor-in-Chief, LT Adam "DOM" Braly
- Recruiting & Social Media Coordinator, LT Sarah "Little Debbie" Beadle
- Webmaster, LT Xan "Carny" Kaplan

CALL SIGNS: A NAVY TRADITION

By: CDR Brennan Cox, PhD, AEP #142

Navy call signs boast a rich history, dating back to the early days of naval aviation. Emerging in the 1930s alongside the rise of radio communication, they served a dual purpose:

- **Identification:** As radio became crucial for pilots, they needed a way to quickly identify themselves and their aircraft during transmissions, especially during intense operations.
- **Security (World War II):** Beyond identification, call signs offered a tactical advantage. Using nicknames instead of real names helped confuse potential enemies eavesdropping on radio chatter.

Originally, call signs were simple, often based on a pilot's name, appearance, or personality. WWII saw a surge in personalized call signs, referencing an aviator's:

- **Personality:** "Steady" for a calm pilot or "Cool Hand" for someone under pressure.
- **Appearance:** "Hawk" for sharp features or "Shorty" for someone on the shorter side.
- **Hometown:** "Chicago" Jones or "Miami" Miller.

From Practicality to Camaraderie

Over time, call signs evolved beyond practicality, becoming a more symbolic and personalized element within Naval Aviation. Following World War II, they became ingrained in aviation culture, sometimes referencing a crew member's embarrassing moment or quirk. This lighthearted hazing ritual fostered a sense of camaraderie and shared experience within squadrons.

Modern Call Sign Assignment

Today, the process of assigning call signs balances tradition with respect and professionalism:

- **Rite of Passage:** Aircrew receive their call signs during a ceremony upon joining their first operational squadron.
- **Brainstorming:** Senior officers or squadron members brainstorm ideas based on the individual's personality, quirks, or physical resemblance.
- **Respectful and Appropriate:** Navy regulations ensure call signs are not offensive or discriminatory.

The AEP Call Sign Review Board

Last September, the Aerospace Experimental Psychology (AEP) community conducted its first Call Sign Review Board. Following policies set forth by Commander, Naval Air Forces, Commander, Naval Air Systems Command, and the Deputy Commandant for Aviation, the process proceeded as follows:

1. **Candidate and Advocate:** The AEP under review (the candidate) selects an advocate of the same or higher rank to represent them during the board meeting. The candidate then leaves the room.
2. **Presenting Options:** The advocate presents a list of potential call signs to the board members, explaining the background of each option and answering any questions.
3. **Board Discussion and Vote:** Board members can propose additional call signs with explanations. All presented call signs are then voted on, with the majority determining the chosen call sign.
4. **Specialty Leader Approval:** To ensure a professional and respectful environment, the Specialty Leader (an active-duty, high-ranking AEP) has the final say, reviewing and approving the chosen call sign in writing.
5. **Official Bestowal:** Once approved, the candidate returns. The Emcee overseeing the board then officially bestows the chosen call sign upon the AEP.
6. **Exceptional Circumstances:** The board's decisions are considered final, with a provision for exceptional circumstances. If new information comes to light, the AEP can submit a request for reconsideration to the Specialty Leader for review.

Legacy of Call Signs

Call signs remain an important symbol of the warrior culture in Navy and Marine Corps Aviation. They link aircrew to their proud history while creating a sense of camaraderie and belonging. This tradition continues to evolve, ensuring call signs serve not just a practical purpose, but also as a badge of honor and a cherished part of naval aviation identity.

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QUANTIFYING MAINTENANCE SAFETY

Adding a predictive component to the Naval Safety Management System: Maintenance Line Operations Safety Assessments (MLOSA)

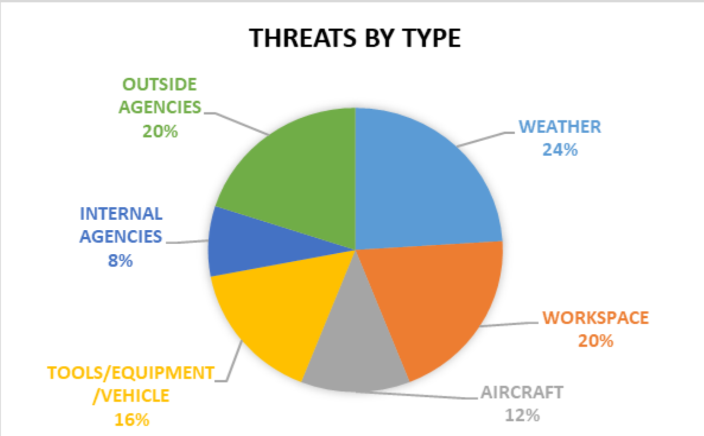
By: LT Sarah Beadle, PhD, AEP #164

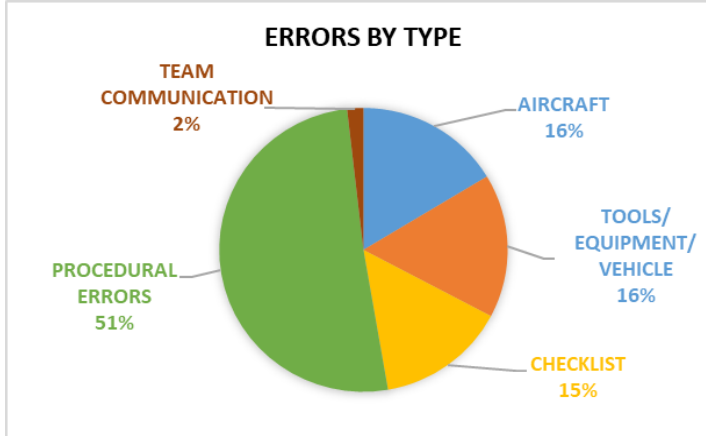
NAVAIR Public Release 2023-405 Distribution Statement A - "Approved for public release; distribution is unlimited"

Have you ever wondered how often people violate standard operating procedures? Or how often weather disrupts an operation and changes the plans of a squadron? There's a way to track that. Introducing *Maintenance Line Operations Safety Assessments (M-LOSAs)*, a method of tracking the everyday threats and errors that occur in maintenance evolutions.

Line Operations Safety Assessments have been a standard way of tracking errors in commercial aviation, including a focus from the Federal Aviation Administration on how to conduct ramp and jump-seat observation periods (FAA Advisory Circular 120-90, 2006). This practice was codified in DoD Instruction 6055.19, which summarizes the role of LOSA efforts in the aviation hazard identification continuum. In the 2021 Naval Safety Command Annual Report, it was reported "the majority of the FY21 Class C [aircraft ground mishaps] were due to performance-based errors that occurred during ground maintenance operations." Looking at the Maritime Patrol and Reconnaissance (MPRA) community more specifically, there were 0 Class A mishaps in FY21, but there was an uptick of Class C and D rates with 16 of the 25 involving personnel injury and 35% of all mishap reports being attributed to human factors. FY21 had a peak in Class D mishaps for MPRA, which has been increasing since 2016.

In 2022, a shore-based P-8A wing embarked on the effort to conduct the first M-LOSA with an operational Navy wing. Four of the CONUS squadrons were observed over five months to capture what threats and errors were the most common in their operations. The difference between this and other efforts? The observers were active duty maintainers capturing what other squadrons were doing- the rule was you can't watch your own operations. Another key difference: It was non-punitive, meaning when the observers saw someone do something unexpected they documented it without notifying the sailor- the exception being when damage of the aircraft or injury was likely or imminent.





Over the course of a 5 month observation period, 12 Petty Officer First Class (E-6) to Senior Chief Petty Officer (E-8) maintainers watched the routine practices of other squadron operations. These were categorized via a codebook written into an iPad application called NeMO (Naval Enterprise Mobile Observation), developed and led by the U.S. Naval Research Lab. The observers would pick a time to go to the hangar or flight line and watch an evolution- targeting servicing, towing, recovery, launch, daily/turnaround, and engine turn activities. Through a prior effort with Naval Test Wing Atlantic and The LOSA Collaborative, a system of coding threats and errors was created, rooted in Threat and Error Management (Klinect, Murray, Merritt & Helmreich, 2003) used throughout the Naval Aviation Enterprise.

During this time, 110 evolutions were observed and coded for threats and errors that occurred. The observers captured 8 Tows, 53 Launches, 10 Recoveries, 27 Servicing, 3 Engine Turns, 6 Daily Inspections, and 3 Turn Around activities. It is also important to note that just because an evolution was observed doesn't mean a threat or error was present. As one of the tenets of conducting a LOSA is that observers don't intervene with the evolution, unless there is danger to safety for the personnel or flight. This made it hard to catch some Maintainer Resource Management factors that might have led to human error- for example things like team communication and fatigue.

Diving deeper into data, a few trends emerged and were captured across squadrons and different maintainers. These became the focal areas for potential interventions– be those training, engineering solutions, or clarification in procedures. The most prominent or relevant errors were separated into these 5 themes:

1. Inconsistent fire bottle monitoring and Flight Light Coordinator distraction
2. Interruptions and traffic from multiple squadron operations on the flight line
3. Improper Personnel Protective Equipment usage
4. Not providing safety information and protective information to visitors
5. Inconsistent communication long cord usage

Beyond just capturing the wing's practices and potential for a future mishap, they also serve as a way to capture maintainer needs. One of the findings from the M-LOSA at both Naval Test Wing Atlantic (NTWL; who piloted the effort) and the P-8A wing was the frequent occurrence of maintainers not wearing appropriate Personnel Protective Equipment (PPE). Diving deeper into this issue, the cranial was often worn improperly or avoided, which was reported 22 times. Finding this at multiple fleet locations lends to an understanding that a larger solution might be needed. This was timely as a new cranial has been fielded by PMA-202 Aircrew Systems at NAVAIR. The HGU 98/P cranial addresses some known issues with the aging HGU24/25 system- it is a more agile design similar to a biking or rock-climbing helmet. The higher profile at the back of the neck should provide better accommodation for female sailors with buns.

The P-8A wing and NAWCAD worked together on this beta test of what M-LOSA could bring to the fleet. We learned some lessons that are important for understanding what is required to manage a program like this with active duty personnel. The biggest takeaway was if active duty personnel are used as observers, a detachment-style structure over a shorter period might be a better solution for manning. The hardest challenge was using senior maintainers local-

HGU 98/P Cranial from Team Wendy. https://www.teamwendy.com/products/helmets-accessories/helmets/exfil-ltp
NAVAIR 13-1-6.7-6

ly where their squadron needed them for other manpower demands. Another effort that could improve the management of the next M-LOSA is creating more awareness in the maintainer community about being observed. While it was important we didn't get "halo behavior" where people saw they were being observed and show diligence they might not normally, the maintainers being observed showed hesitance and a lack of buy-in because they did not fully understand the nature of M-LOSA being non-punitive and data being stored separate from the wing to protect their interests.

With campaigns like *Get Real, Get Better* and Navy Medicine's focus on High Reliability Organization practices, M-LOSA is a force multiplier for trying to better understand the causes and provide interventions to prevent aviation ground mishaps. While past efforts to understand error in Naval Aviation have focused on retrospective reviews after a mishap, M-LOSA looks at the systematic threats and errors facing an active duty wing before a mishap occurs. A new view of human error focuses on this as a symptom, not the cause of a failure, connected to the entire operating environment and different goals at play (Dekker, 2002). Efforts like M-LOSA focus not on one individual making a mistake but understanding the errors involving regular tasks and tools being used. There is potential for a method like M-LOSA to quantify the threats and errors in everyday operations and enable us to track these over time and across squadrons. By using mechanisms where we focus on the larger picture of everyday operations, we can work to better keep our maintainers safe and avoid future aircraft and facilities damage.

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TO PEE OR NOT TO PEE

A spotlight on urine-retention and bladder-relief studies at Naval Medical Research Unit Dayton

By: LT Xan Kaplan, PhD, AEP #165

Mission requirements in U.S. Naval aviation often necessitate long hours in the cockpit. Aviators sometimes choose to restrict fluid intake in order to avoid the need to urinate—a strategy called tactical dehydration. However, the gravity of proper hydration has long been understood. Insufficient hydration poses problems as it can cause a variety of negative effects from increased risk of urinary tract infection (UTI) to problems with cardiovascular and mental health1. In aviation, mild dehydration at only 3% can result in a 40% reduction in G-tolerance2. The associated decline in spatial awareness and decision-making is comparable to drunkenness3. This means that even a flying whiz is at risk if they aren't well-hydrated. In contrast, proper hydration improves cognitive and flight performance4. Therefore, understanding the negative impacts of dehydration and how to prevent them is of utmost importance to the Navy.

To address this issue, scientists at Naval Medical Research Unit Dayton (NAMRU-D) are putting the pee in Ph.D. by conducting a series of human subjects research and test and evaluation studies. Sprinkled in amongst our usual motion sickness, extended-reality, and training work are several studies relating to bladder relief.

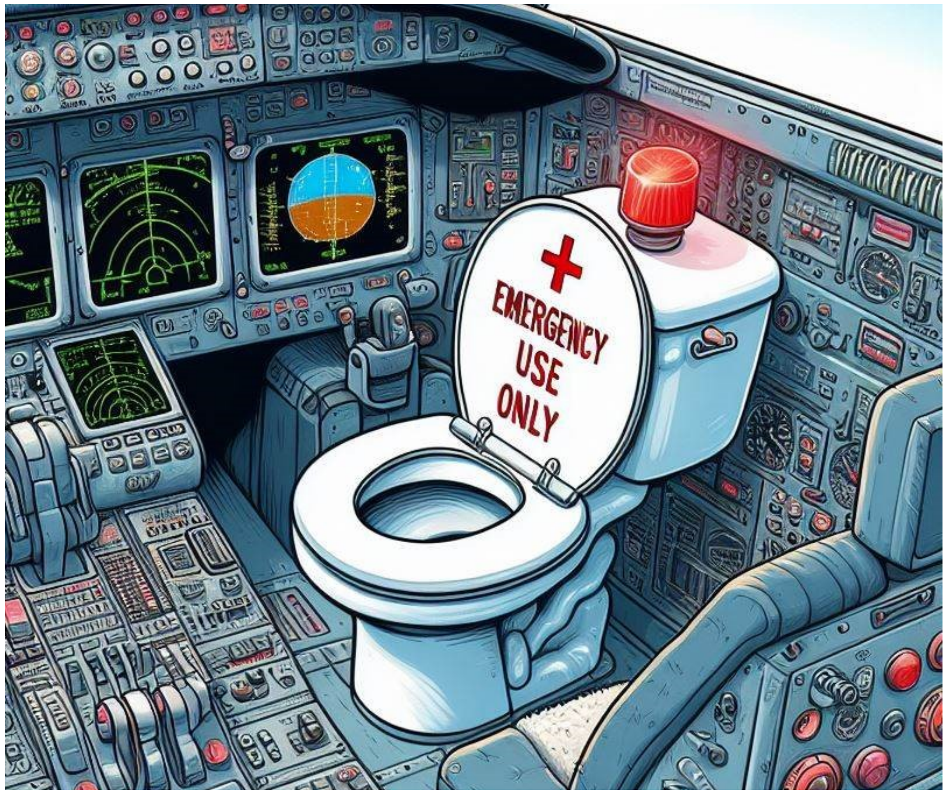
The Combined Effects of Hypohydration and Hyperoxia (CoDOx) study is investigating the physiological and cognitive impact of fluid restriction, fluid loss through exercise, heat stress, and hyperoxic (73%) gas exposure. In the study, research participants exercise for up to two hours in the Darwin Environmental Chamber, where the temperature is set to 86-90F with 30% humidity. They do this both in a dehydrated and hydrated state. In the dehydrated condition, participants will lose ≥2% body mass due to water loss. In the hydrated state, fluid replacement will allow the maintenance of body mass. Participants will also be exposed to either normoxic or hyperoxic gas. Inflammatory markers in the blood (TNF-a, IL-1ß, IL-6), the concentration of the hormone erythropoietin, exercise capability, orthostatic tolerance, pulmonary function, muscular dexterity, hand grip strength, and cognitive function will be examined in both the dehydrated and hydrated states. Results will lead to a better understanding of the impacts of lack of proper hydration.

Another quasi-experimental study examines the impact of urinary retention on flight-relevant cognitive performance over a 3-hour time period. Twenty-nine participants drank 0.75 L of water and completed a psychomotor vigilance task at 1, 2, and 3 hours following water intake. Vigilance was measured through the P3b event-related potential (ERP) and working memory was measured through a change detection task. During the change detection task, contralateral delay activity was assessed via electroencephalography (EEG). Both performance and reaction time on the vigilance task were worse the longer participants voluntarily practiced urine retention, indicating a degradation of sustained attention that is linked to withholding urine.

Some bladder-relief devices designed for in-flight use exist and can help to mitigate some of these concerns. However, urine for some trouble if the device ever fails. That's why they must be rigorously tested before being used in a flight environment.

A test and evaluation study, Unmanned Evaluation of Bladder Relief Devices for Military Aviation, has examined the survivability, safety, and functionality of a particular Aircrew Bladder Relief Device (ABRD) that had not yet been independently tested in a simulated tactical environment. In this particular study, the ABRD is exposed to a simulated gradual climb, moderate climb, and rapid decompression in a hypobaric chamber. The device is tested both empty and with liquid delivered at a rate consistent with human elimination volumes. Device success is determined through a thorough inspection looking for any hardware, or operational malfunctions.

Another study is examining the Barriers



to Mission Extending Devices Among Female Aviators. This study uses a cognitive walkthrough/talkthrough methodology as well as focus groups to determine the human factors and usability issues that may negatively affect the acceptance and use of in-flight bladder relief devices, particularly among women. Many devices on the market have been proven effective with little risk of failure, yet many individuals still practice urinary retention and tactical dehydration to avoid using them. This study aims to determine why this is and what common fears and complaints exist regarding these validated devices.

Taken together, these studies whet an appetite for increased research concerning the impact of improper hydration. Being dehydrated reduces cognitive function essential for the complex tasks in our line of work. Being adequately hydrated but practicing urinary retention also has the same effect. There are options for bladder-relief devices, but many people choose and prefer to practice one of the other cognitively degrading options.

What can be done? The first goal is clear. Adequate hydration must be a priority, as must suitable options for the resulting elimination of waste. Current studies, both at NAMRU-D and elsewhere, have focused on perfecting bladder-relief devices. Others have examined different hydration or urine retention strategies. While the issue has not yet been solved, the numerous research streams show that hydration-related matters are a number one priority.

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SEX DISPARITIES IN AEROSPACE MEDICINE

Exploring sex differences on aeromedically relevant environmental stressors

By: LT Kaila A. Vento, PhD, AEP #169

Original research was conducted at Naval Medical Research Unit-Dayton by LT Kaila A Vento, Cammi K Borden, and Kara J Blacker

The urgent need to address sex disparities in aerospace and operational medicine arises from the underrepresentation of female aviators in the design and development of aircraft systems (Bustamante-Sánchez, Delgado-Terán, & Clemente-Suárez, 2019; Marintseva et al., 2022). This lack of inclusion has resulted in a limited understanding of the differences between male and female aviators regarding aircraft human performance, potentially leading to suboptimal safety, performance, and health guidelines for female servicemembers.

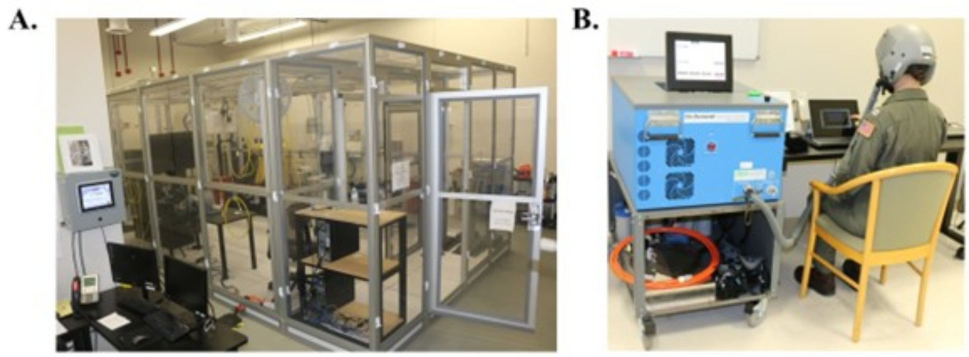

Figure 1. (A) Reduced Oxygen Breathing Environment (ROBE) where studies 1-4 and 6 took place. (B) On-Demand Hypoxia Trainer (ODHT) utilized for study 5. *Photos courtesy of NAMRU-D*. Source: Frontiers in Physiology. Copyright 2022.

One area of concern in aviation is the threat of hypoxia, a deficiency in oxygen supply (Elliott & Schmitt, 2019). Hypoxia has detrimental effects on sensory, cognitive, and motor functions and decision-making abilities. It can cause aircrews to struggle with maintaining a consistent airspeed, altitude, and directional heading during flights (McMorris et al., 2017). While these performance deficits associated with acute hypoxia are well documented, there is a shortage of research on how individual differences, including sex, may contribute to hypoxia symptoms and performance impairments. Previous aviation-relevant hypoxia studies excluded females, while others lacked a large enough sample size or did not specify participants' sex (Fehrenbacher et al., 2021; Kasture et al., 2021; Lucertini et al., 2020). This knowledge gap is critical for implementing timely emergency procedures, facilitating recovery, and designing effective in-cockpit sensor systems, as symptoms, experiences, and performance may vary between male and female aviators under hypoxic conditions.

Hypoxia's impact on performance and sex disparities in aerospace medicine necessitates studying male and female aviators' responses to low-oxygen events for improved early warning systems. Therefore, we retrospectively examined six experimental hypoxia studies, with 116 participants datasets (78 male and 38 female participants) collected from 2017 to 2022 at the Naval Medical Research Unit- Dayton (NAMRU-D) (see Table 1 and Figure 1). We performed linear regression models analyzing the independent variables (i.e., personal characteristics= sex, age, and body mass in-

Study name	Sample size	Altitude (O_2%) exposure minutes	Study outcomes
Study 1: Seech et al. (2020)	N = 40 male, n = 27, female, n = 13	17,500 ft (10.6%), 27-min	SpO_2, HR, hypoxia-related symptoms, ERPs, VTT
Study 2: Blacker et al. (2021)	N = 29 male, n = 21		
	17,500 ft (10.6%), female, n = 8	17,500 ft (10.6%), 27-min, 27-min	SpO_2, HR, hypoxia-related symptoms, ERPs, VTT
Study 3: Blacker & McHail (2021)	N = 31 male, n = 17, female, n = 14	20,000 ft (9.7%), 10-min	SpO_2, HR, hypoxia-related symptoms, ERPs, PVT
Study 4: Blacker & McHail (2022)	N = 34 male, n = 16, female, n = 18	20,000 ft (9.7%), 15-min	SpO_2, HR, hypoxia-related symptoms, ERPs
Study 5: Unpublished data[a]	N = 34 male, n = 21, female, n = 13	10,000–25,000 ft (14.3–8.1%), 20-min	SpO_2, HR, hypoxia-related symptoms, ERPs, HAT
Study 6: Unpublished data[a]	N = 21 male, n = 16, female, n = 5	20,000 ft (9.7%), 15-min	SpO_2, HR, hypoxia-related symptoms, ERPs, CCT

Table 1. Hypoxia studies for retrospective analyses. *Note*. Abbreviations (SpO2 = peripheral oxygen saturation; HR = heart rate; ERPs = event-related potentials; VTT = visuomotor tracking task; PVT = psychomotor vigilance task; HAT = Hypoxia Awareness Tool [visuomotor, cognitive, and working memory tasks]; CCT = cone contrast task). [a]Studies 5 and 6 completed in 2022. Source: Frontiers in Physiology. Copyright 2022.

dex [BMI]; environmental factors= altitude and exposure minutes) on the dependent variables (i.e., peripheral capillary oxygen saturation [SpO2], heart rate [HR], neural modulation [event-related potentials, ERPs], cognitive performance, hypoxia-related symptom frequency). Additional regression models analyzed the above independent variables on each hypoxia-related symptom. We included the beta (β) or odds ratio (OR), 95% confidence intervals (95% CI), and p-values for each dependent variable per model, along with the variance explained (R2). All statistical analyses were performed with a significance level of p<0.05 (see Table 2).

We found that the female sex predicted lower SpO2 (p<.001, 95% CI [-5.42, -0.83]), though, in combination with age and BMI alone, it explained only 6% of the variance. Female participants were 3.33 times more likely to report a headache (p=.02, 95% CI [1.18, 9.43]) during hypoxia. Age significantly predicted decreased HR and was associated with increased reports of hot flashes, headaches, and fatigue, all ps<.05. Expectedly, increased altitude significantly predicted lower SpO2, higher hypoxia-related symptom frequency scores, and increased reports of several individual symptoms, such as tingling, dizziness, tunnel vision, loss of coordination, headache, breathlessness, and apprehension, all ps<.05. The ERPs and cognitive performance models did not converge, suggesting high intra-individual variability. Together, sex, age, and BMI were not the most robust predictors in responses to hypoxic challenge; we cannot infer this for sensory deficits and cognitive performance within an experimentally induced hypoxic environment.

These findings contribute to the limited but growing research on potential sex differences in response to hypoxic challenges. Moreover, they highlight the need to bridge sex disparities in aerospace medicine and operational health. These results can be used to improve hypoxia familiarization training in aviation safety programs, enhance the development of pilot monitoring sensor systems, and update emergency response and recovery protocols in the event of hypoxia incidents for all aircrew members. We recommend further investigation into the impact of sex and individual differences on physiological, sensory, and cognitive performance in response to hypoxia and other relevant environmental stressors in aviation medicine.

The original article was published in Frontiers in Physiology:

Vento, K.A., Borden, C.K., and Blacker, K.J. (2022). Sex comparisons in physiological and cognitive performance during hypoxic challenge. *Front. Physiol. 13:1062397*. doi:10.3389/fphys.2022.1062397

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	Model 1				Model 2			
	β	95% CI	*p*	R^2	β	95% CI	*p*	R^2
SpO_2 (%)				0.06				0.18
Sex[a]	−2.67	(−5.06, −0.29)	0.03−		−3.13	−5.42, −0.83)	0.01**	
Age	0.14	(−0.05, −0.29)	0.15		0.14	(−0.04, 0.33)	0.13	
BMI	−0.31	(−0.45, 0.19)	0.42		−0.10	(−0.40, 0.20)	0.52	
Altitude (k)[b]					−0.86	(−1.31, −0.42)	0.01**	
Exposure (min)[c]					−0.18	(−0.35, −0.01)	0.04−	
HR (bpm)				0.08				0.11
Sex	1.16	(−4.08, 6.39)	0.66		1.50	(−3.80, 6.81)	0.58	
Age[d]	−0.69	(−1.12, −0.26)	0.01**		−0.69	(−1.12, −0.26)	0.01**	
BMI	0.01	(−0.69, 0.72)	0.97		−0.02	(−0.72, 0.68)	0.96	
Altitude (k)					0.18	(−0.09, 1.97)	0.07	
Exposure (min)					0.15	(−0.25, 0.55)	0.46	
Hypoxia-related symptomfrequency score (*n*)				0.01				0.22
Sex	0.58	(−0.45, 1.62)	0.27		0.61	(−0.33, 15.6)	0.20	
Age	0.02	(−0.06, 0.11)	0.59		0.03	(−0.05, 0.10)	0.51	
BMI	0.01	(−0.13, 0.15)	0.91		0.00	(−0.12, 0.13)	0.99	
Altitude (k)[e]					0.47	(0.28, 0.65)	0.01**	
Exposure (min)					0.01	(−0.06, 0.08)	0.73	

Table 2. Linear regression models of physiological and self-reported hypoxia-related symptom frequency outcomes. *Note*. Abbreviations (**β =** beta; CI = confidence interval; R^2 = variance explained; SpO_2 = peripheral capillary oxygen saturation; BMI = body mass index; HR = heart rate; ERPs = event-related potentials). Male reference value for sex. SpO_2 and heart absolute change between normoxia and hypoxia exposures.

[a]Female sex significantly predicted decreased SpO_2, $p = .01$.

[b]Altitude significantly predicted decreased SpO_2, $p < .001$.

[c]Exposure minutes significantly predicted decreased SpO_2, $p = .04$.

[d]Age significantly predicted decreased HR, $p = .01$.

[e]Altitude significantly predicted increased hypoxia-related symptom frequency scores, $p < .001$. $^{**}P < .01$ $^{*}P < .05$,

Source: Frontiers in Physiology. Copyright 2022.

MEET AN AEP

LT Xan Kaplan, AEP #165, talks about her journey from grad school to the Navy

What is your Academic Background?

I have a B.A. in Psychology, a M.A. in Applied Experimental and Human Factors Psychology, a graduate certificate in Design for Usability, and a Ph.D. in Human Factors and Cognitive Psychology. When I was an undergraduate, I had no idea Human Factors even existed! One day I was googling my two interests—Psychology and Computer Science—and found a website for the University of Central Florida's Human Factors program. Prior to seeing that website, I had not even planned to go to graduate school. But I knew immediately it was the field for me. I was lucky enough to be accepted into a lab run by Dr. Peter Hancock, where my love of Human Factors grew.

How did you learn about the AEPs?

I was at the Human Factors and Ergonomics Society Annual Meeting in Seattle, when I saw some people wearing flight suits. They were doing interviews, so I had the opportunity to learn what AEPs do. I was thrilled at the prospect of being able to do research that directly addressed the need of the fleet, without being filtered through the needs of a business or an academic institution. Right away, I knew I was interested in becoming an AEP. When I was closer to completing my Ph.D., I began the (long) application process.

What was the most challenging part of AEP training?

For me, the hardest part of AEP training was actually the initial part of training at Officer Development School. This is the beginning of most AEP's journeys, where we go to Newport to learn military bearing, customs, and history among other things! I have no military background, nor does anyone in my family, so the experience was entirely new to me. It took me a long time to learn all the ranks and insignias! But once I did, I felt so comfortable in the military environment. Incidentally, ODS was also one of the most fun and informative places I have been!

What was your most memorable moment during training?

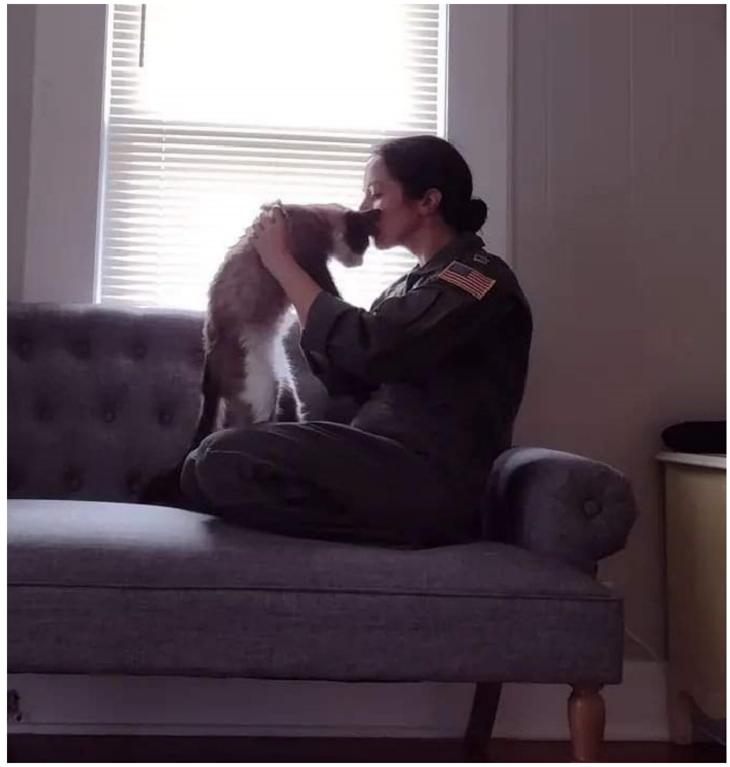
My most memorable moment was the first time taking off in the T6. I had spent so long in ground school learning how everything worked, and spent many pulled G's, we did aerobatics…and I found out I get airsick.

What are you working on now?

Currently, I am at the Naval Medical Research Unit Dayton, where I am working in the Biomedical Sciences Department. I am on a lot of projects, but my favorite

LT Xan Kaplan earns her "wings of gold" at a ceremony on February 11th, 2022. She is pictured with her father and sister.

LT Xan Kaplan enjoying some time with her cat Ragu after a long day of work.

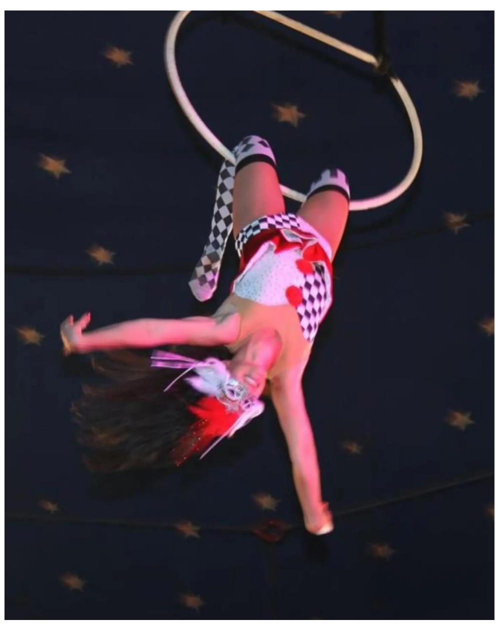


research at NAMRU is anything involving the Disorientation Research Device, or "the Kraken." It is a 6 degrees-of-freedom motion platform and flight simulator all rolled into one, and definitely the coolest thing I have ever seen! I am currently PI on a study examining ways to mitigate motion sickness, which I have a very big interest in!

What is something other people are surprised to learn about you?

Though the other AEPs all know about my unique background, a lot of people are surprised to learn that I used to work in a travelling circus. I was a fulltime performer for five years, working first in a motorcycle act and then becoming an aerial acrobat. My work took me all over the USA, and I have performed in tents, casinos, theaters, and fairgrounds. My favorite apparatus is the aerial silks, and I still practice from time to time. I took online classes every day during intermission, and eventually left to get my Ph.D. at the University of Central Florida. I first joined the circus because I wanted to be paid to travel and indulge my love of heights—two things I still get to do as an AEP!

LT Xan Kaplan performing aerial acrobatics with the circus..



What is the best part of being an AEP?

The best part of being an AEP is the opportunity for adventure. I have already had the opportunity to fly on several different platforms, see mid-air refueling, go to multiple conferences, travel to places like Aberdeen and Hawaii, and conduct research that never would have been possible in most jobs! The other best part of being an AEP is the other AEPs! We are such a small, tight-knit community that we truly feel more like a family.

NREIP Participating Labs Across the Country

Award duration is a continuous 10 weeks.

NREIP offers a competitive **stipend** for its interns.

- New undergraduate student participants: $7,500
- Returning undergraduate students (students MUST have completed a full 10-week program in a prior year to receive this level): $9,000
- Graduate students (students must currently be in graduate school and taking graduate school courses to receive this level): $11,500

For internship details visit:

NAVALSTEMINTERNS.US

Contact Us: nreip@saxmanone.com / (703) 530-9523 Ext. 7

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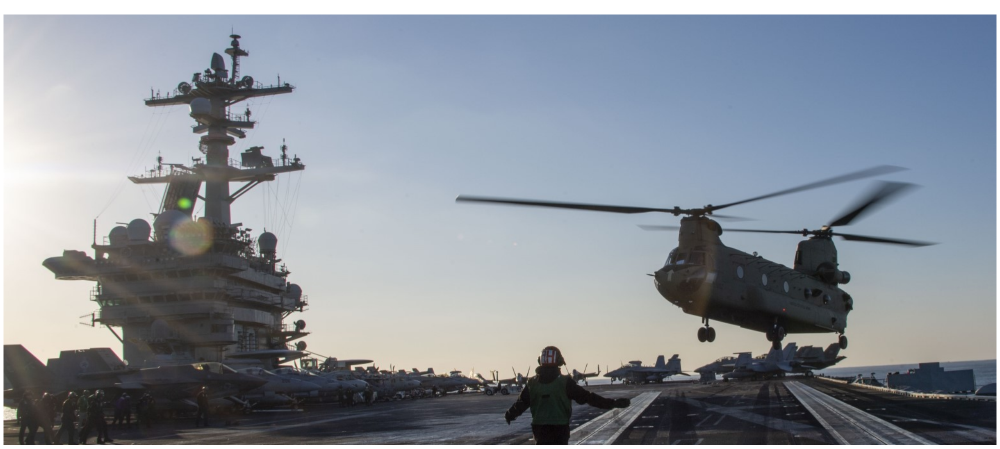
The Naval Research Enterprise Internship Program (NREIP) serves as an excellent opportunity for those with interest in a career as an AEP to get exposure to work in the DoD and even potentially be mentored directly by an AEP for the summer. Applications open August 1st and usually close at the end of October or early November. Information is posted on their website at:

https://www.navalsteminterns.us/nreip/

INTERNSHIP OPPORTUNITY

LT Sarah Sherwood serves as an example of a successful transition from NREIP Intern to Navy AEP. She interned at the Naval Research Lab during her time as a graduate student, allowing her to gain experience conducting research with the Navy as she prepared to complete her human factors dissertation.

A few locations where you can apply to work alongside AEPs: Naval Air Warfare Center Aircraft Division (NAWCAD), Naval Air Warfare Center Training Systems Division (NAWCTSD), Naval Research Lab (NRL- Washington, D.C.), and Naval Medical Research Unit Dayton (NMRU-D). If you are interested in a potential connection to one of these sites and are a current graduate student, please use the "Contact Us" portion of the AEP website as the call for applications opens: https://navyaep.com



EVENT SCHEDULE

Society for Industrial and Organizational Psychology (SIOP)
18-20 APR 2024
Hyatt Regency
Chicago, IL

DoD Human Factors Engineering Technical Advisory Group (HFETAG; NASA Hosting)
22-26 APR 2024
Marshall Space Flight Center
Huntsville, AL

Aerospace Medical Association (AsMA)
5-9 MAY 2024
Hyatt Regency
Chicago, IL

Military Health System Research Symposium (MHSRS)
Dates: TBD ant Aug 2024
Orlando, FL

SAFE Symposium
22-24 OCT 2024
Virginia Beach, VA

Human Factors and Ergonomics Society (HFES)
08-13 SEP 2024
Arizona Biltmore
Phoenix, AZ

Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC)
02-06 DEC 2024
Orange County Convention Center
Orlando, FL

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