

AIRBORNE HAZARDS AND BURN PITS  
**CENTER OF EXCELLENCE**



# AIRBORNE HAZARDS AND BURN PITS CENTER OF EXCELLENCE

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## Annual Report

June 2025

**VA**



U.S. Department  
of Veterans Affairs

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**01**



**Welcome**



## Letter from the Co-Directors

This past year, we celebrated several milestones, including the 5-year anniversary of the AHBPCE, the 10-year anniversary of the AHOBPR symposium, and the inaugural Visiting Scholar Program. We are also excited about expanding our control group sites to include San Francisco in addition to Ann Arbor and Nashville, which will give us a reference comparison to interpret our specialty clinical evaluations.

Another major milestone is the Airborne Hazards and Open Burn Pit Registry (AHOBPR) redesign, which has created a larger and more inclusive Registry. We worked with the environmental health clinician and the Veterans Exposure Team - Health Outcomes Military Exposures (VET-HOME) to finish all requested evaluations. The redesigned Registry includes broadened eligibility criteria, automatic enrollment based on Department of Defense (DoD) records, and the ability for Veterans to opt out of participation if they wish.

In addition, we have established an Executive Board Committee. The Executive Committee (EC), led by AHBPCE under the HOME program office, is committed to serving Veterans with military environmental exposures through strategic guidance and oversight of the Registry. The AHOBPR-EC is an executive-level body dedicated to guiding multifaceted efforts across operations, research, surveillance, and communications that directly or indirectly involve the AHOBPR.

We continue to honor the mission of the AHBPCE to better understand and improve care for Veterans with deployment-related health concerns.



**Anays Sotolongo, MD**



**Michael Falvo, PhD**



## Who We Are

The Airborne Hazards and Burn Pits Center of Excellence (AHBPCE), located at the New Jersey War Related Illness and Injury Study Center (NJ WRIISC), was officially recognized by Congress and the President in Public Law 115-929 as a VA Center of Excellence in May 2019.

The Center focuses primarily on:

- Clinical and translational research related to airborne hazards and burn pits
- Specialized evaluations and diagnostic approaches to unexplained shortness of breath and other respiratory conditions
- Detection of emerging patterns in health conditions using data from the Airborne Hazards and Open Burn Pit Registry (AHOBPR)
- Education that involves developing and disseminating best practices that can improve health outcomes for Veterans

**We are advocates for Veterans who have concerns about potential adverse health outcomes related to airborne hazard exposures. Through ongoing research and clinical work, we seek to understand and find solutions for these exposure-related health issues. Through education and outreach, we provide information to providers and Veterans on our findings that can lead to better evaluation, management, and care.**

The following sections highlight our efforts across research, education and outreach, clinical work, and the Registry.



02



Research



## Advancing Knowledge About Airborne Hazards

AHBPCE researchers are committed to improving the diagnosis, management, and treatment for Veterans facing health concerns related to airborne hazard exposures. Using data from the VA Airborne Hazards and Open Burn Pit Registry, clinical evaluations, and other sources, researchers can identify questions and conduct in-depth studies that will help find answers to these concerns.

Research conducted by the Center of Excellence and other collaborators is regularly published in peer-reviewed journals and presented at national and international scientific meetings. For a full list of published research, please see [the appendix](#).

### Pilot Research Project Program

The Pilot Research Project Program supports VA-affiliated investigators in the pursuit of preliminary data and/or proof-of-concept feasibility studies to develop novel research questions across the spectrum of basic, clinical, and health services research.

This is AHBPCE's sixth year supporting these investigators.

Applications with a strong rationale that clearly articulated both the potential impact for Veteran health as well as the near-term leveraging potential for future funding are given the highest priority. A two-tiered review system is used to evaluate each application, including external subject matter expert critique and internal programmatic review.

Principal Investigator	Institutions	Project Title
Boruch, Alexander	University of Wisconsin-Madison; William S. Middleton VA Hospital; Dept of Kinesiology	Acute Exercise & DNA Methylation in Gulf War Illness
Citron, Bruce	VA New Jersey Health Care System; Department of Molecular Biology	Identifying targets for neuroprotection against airborne hazards
Ganguly, Anutosh	University of Michigan; Ann Arbor VA; Dept of Surgery	Investigating Pathogenesis and Treatment of Constrictive Bronchiolitis
Gemoets, Darren	Stratton VAMC; Research & Development	Developing predictive and inferential machine learning models for identifying associations between airborne hazards, smoking, and cancer
Razjouyan, Javad	IQuEST; Michael E DeBakey VA Healthcare System; Baylor College of Medicine; Health Services Research	Direct and Indirect Effect of Burn Pit Exposure on Sleep: A Machine Learning Approach
Wu, Tianshi David	IQuEST; Michael E DeBakey VA Healthcare System; Baylor College of Medicine	Association of Base-Specific Deployment Patterns and Later-Life Respiratory and Cardiovascular Disease in the Airborne Hazards and Open Burn Pit Registry

## Research at the Center

A highlight of working in an integrated clinical research center is the ability to pursue independent research questions that are informed by our clinical experience. AHBPCE investigators are fortunate to have several projects externally supported by VA's Office of Research & Development (ORD) and the Department of Defense's (DoD) Congressionally Directed Medical Research Program (CDMRP).

This year, the Center was awarded a new grant through the CDMRP Toxic Exposure Research Program (TERP) working in collaboration with The Ohio State University (OSU). OSU will be running a mouse model of exposure while the study team at AHBPCE conducts the human study. Additionally, Center investigator Dr. Daniel Wilhite opened a pilot protocol examining the myriad causes of exertional dyspnea in Veterans.

Title	Status	Agency (project number)	Collaborators
Cardiovascular Risk-Profiling of Deployment-Related Respiratory Disease: A Translational Approach	Preparing for recruitment	CDMRP (TX230162)	Ohio State University
Investigating Residual Exertional Dyspnea	Preparing for recruitment	Center-funded	
Airborne Hazards and Burn Pits Center of Excellence Data Repository	Active	Center-funded	
Pulmonary Vascular Dysfunction after Deployment-Related Exposures	Preparing final manuscript	VA-ORD (I01CX001515)	Rutgers University
Lung Injury Etiology, Risk Factors and Morbidity of Single and Repeated Low-Level Blast Overpressure Exposure	Preparing final manuscript	CDMRP (W81XWH-19-2-0059)	Walter Reed, Houston VA
Post-Exertion Malaise in GWI: Brain, Autonomic and Behavioral Interactions	Preparing final manuscript	VA-ORD (I01cx001329)	Madison WI VA
Advancing Non-Invasive Diagnostics and Treatments of Deployment-Related Chronic Lung Disease in Gulf War Veterans	Final manuscript under review	VA-ORD (I0BX004740)	Ann Arbor MI VA

## Academic Partnerships

As part of our charge, the AHBPCE is expected to participate with VA and non-VA academic institutions “to enrich and expand VA expertise in caring for Veterans exposed to airborne hazards.”

These collaborations enrich and enhance our knowledge.

Through its research endeavors, AHBPCE has set up the Airborne Hazards and Burn Pits Center of Excellence Data Repository, a centralized system for storing research and operations data. The repository will house data collected from AHBPCE and its affiliated sites. The AHBPCE Data Repository will support AHBPCE’s charge as a Veterans Health Administration Center of Excellence.

The AHBPCE Data Repository directly aligns with VA, VHA, and VA ORD’s strategic priorities of advancing knowledge of military environmental exposures to improve the health and care of Veterans. AHBPCE’s cardiopulmonary physiology focus—across operations and research activities—allows for a highly unique and comprehensive resource within VA to facilitate new research opportunities for intended users. Through data sharing, the datasets affiliated with AHBPCE will be used for new research to improve the diagnosis, treatment, and outcomes of care for all Veterans.

Along with data from internal VA research, the repository will house control group data from our academic partners. The control group data will enable the AHBPCE to develop critical information to compare clinical data from Veterans with deployment-related respiratory disease.

Academic Partner	Title
Vanderbilt University Medical Center	Post Deployment Cardiopulmonary Evaluation Network Control Group Protocol
University of Michigan	Post Deployment Cardiopulmonary Evaluation Network Control Group and Repository
University of California, San Francisco	Lung and Heart Function Across Decades of Life in Healthy Population

## New Jersey Institute of Technology (NJIT) Projects



*NJIT Dyspnea Team*

### Project 1: Dyspnea Inspiratory Loading Device

The objective of this project is to create a device that induces dyspnea (breathlessness) while patients are in a functional MRI (fMRI). Oftentimes, Veterans complain of shortness of breath or breathlessness, although they do not have any pulmonary issues or diagnosis. Researchers believe that this feeling could be neurological and therefore need a device that induces dyspnea in healthy subjects so they can see how the brain performs under this condition.

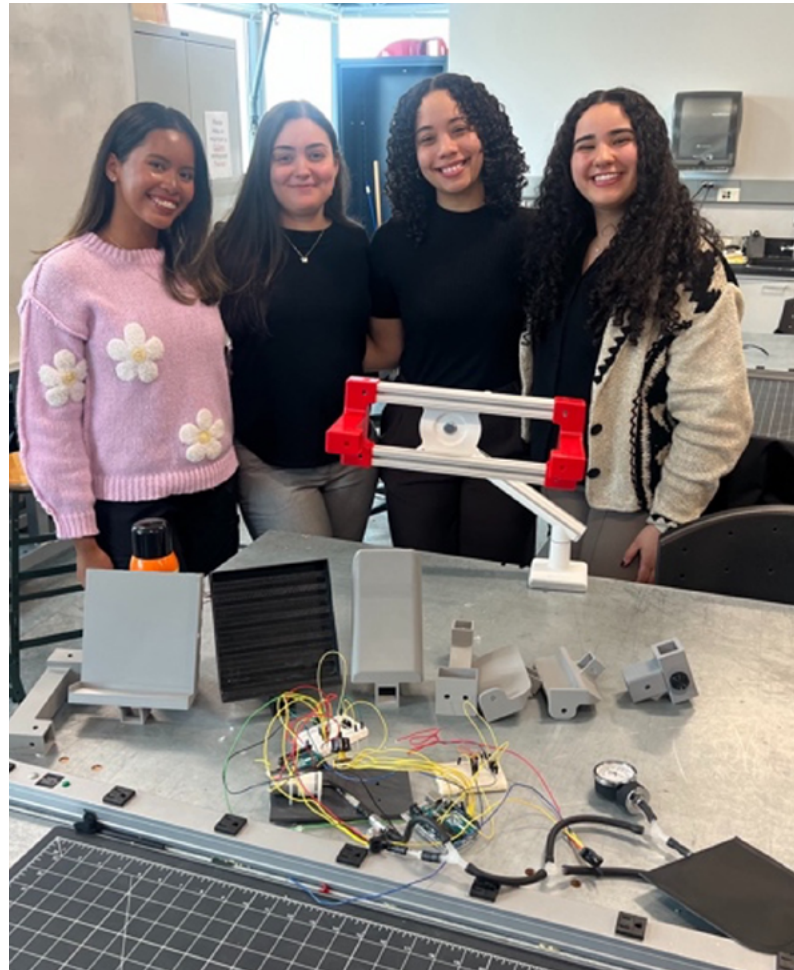
**For the past three years, our team has provided mentorship to students working on NJIT capstone projects. For this project, we are collaborating with the Rocco Ortenzio Neuroimaging Center at Kessler Foundation.**

The device, named DIME, is designed to control the inhalation of the subject in order to give the subject a sensation of "air hunger." This is done by having the subject breathe through a mouthpiece connected to an antimicrobial filter and a nonbreathing valve (so that exhaled air is released while inhaled air moves through the rest of the device). The valve is connected to polypropylene tubing that would be about 25 feet long (varies depending on the setting it will be used in). This tube would go from the MRI room to the control room, where it would be sealed to a 3-D printed casing with a dial of different size bores to create resistance while breathing.

## Project 2: FOT Patient Assist Device

The objective of this project is to create a device that assists a patient while performing a Forced Oscillation Technique (FOT) test. The FOT test is a non-invasive method to assess airway function by emitting oscillatory signals during breathing. Patients typically need to sit in an upright position while keeping their elbows up and their hands on their cheeks for optimal test results. This can be straining and uncomfortable for some Veterans.

The capstone students were presented with this issue and have designed a portable device that acts as a head rest for the patient. This device would be set up prior to the patient completing an FOT test. The device consists of an arm mount with a head rest and cheek padding. The padding helps apply slight pressure to the cheeks to simulate an individual holding their cheeks. The patient will be able to rest their chin on the device for comfort. To achieve slight cheek pressure, there is a small air pump to inflate the cheek padding to a comfortable level during the test.



*NJIT FOT Team*

## Rutgers, The State University of New Jersey

ABHPCE has an ongoing academic partnership with Rutgers School of Engineering. Students work with a mentor at the AHBPCE and contribute to the design and construction of a custom open-circuit acetylene wash-in system for estimating cardiac output during exercise in Dr. Wilhite's Applied Pulmonary Physiology Laboratory.

**The project involves close collaboration with experts in cardiopulmonary physiology. This innovative effort lays the groundwork for a new research protocol aimed at evaluating cardiac output across multiple resting and exercise conditions.**

## Living Evidence Analysis Program (LEAP)

A top priority for VA is to provide appropriate and timely benefits for Veterans who were exposed to military environmental hazards. To accomplish this goal, we focused on efficient evaluation of evidence for health care and policy decision-making. In collaboration with Dr. James Parrott (Rutgers University) and Health Outcomes Military Exposure (HOME), the AHBPCE developed the HOME-LEAP project.

This year's updates in the HOME-LEAP project included:

- Consensus meetings by the scientific panel were held to determine strength of evidence for multiple streams of ILD Veteran research (environmental, pre-clinical, civilian, epidemiology), using Weight of Evidence (WOE) methodology.
- A methods poster was presented at the MHSRS 2024 Conference in Orlando, titled, "Exposure to Airborne Hazards and Interstitial Lung Diseases among Deployed Soldiers: A Weight of Evidence Synthesis of the Scientific Literature."
- Oral presentation was done at the Global Evidence Summit in Prague in September titled, "Nimble Evidence Synthesis: A Method for Continuous Evidence Synthesis to Support Policy Decision-Making Concerning the Effects of Complex Environmental Exposures."
- A methods manuscript titled "Military Open Burn Pits and the Risk of Cardiopulmonary Diseases: A Systematic Literature Review and Meta-Analysis" was submitted to Cardiovascular Toxicology.
- A standalone website (VADRR: Veterans Affairs Data Repository Rutgers) was built out from SRDR+ (Systematic Review Data Repository) to streamline project findings and trainings.
- An AI Large Language Model (LLM) is being trained for enhanced article screening in SRDR.
- An evidence synthesis "content" manuscript is being prepared. This manuscript will contain meta-analysis results and a summary of the current state of ILD Veteran research.
- Research content expanded to autoimmune and sleep outcomes, in the process of screening in relevant articles and extracting data.

## Special Projects

### Oscar Auerbach Visiting Scholar Program

The Oscar Auerbach Visiting Scholar Program supports VA investigators who are motivated to understand the incidence and prevalence of cancers (and/or other potential health conditions) among AHOBPR participants. This program provides multi-year support to highly accomplished VA investigators who are working to pursue research questions pertaining to long-term health outcomes (i.e., cancer or other noncommunicable diseases) among Veterans with military environmental exposure.

The Visiting Scholar Program is named in honor and memory of Dr. Oscar Auerbach (pictured below), a physician scientist who most notably conducted seminal pathological studies on the relationship between tobacco smoke and lung cancer. His work also included studies on exposures related to asbestos and mining of uranium. Dr. Auerbach's pioneering work was featured prominently in the 1964 U.S. Surgeon General Report, which officially linked smoking to lung cancer. This work was conducted at the East Orange Campus of the VA New Jersey Health Care System—and the current site of the AHBPCE.



In 2024, AHBPCE selected its first two Visiting Scholars: Mohamed Seedahmed, MD, MPH, and Bhavika Kaul, MD, MAS. The Visiting Scholar Program will provide multi-year support to Seedahmed and Kaul, who will pursue research questions that can help improve long-term health outcomes among Veterans with military environmental exposures.

The AHBPCE is thrilled to support the important work of these two investigators as they work to uncover best practices in care for Veterans with exposure concerns. The program officially began October 1, 2024.

**Mohamed Seedahmed, MD, MPH**

Dr. Seedahmed is an assistant professor of medicine in the Division of Pulmonary, Allergy, Critical Care, and Sleep Medicine at the University of Pittsburgh and an attending physician at the VA Pittsburgh Healthcare System, with a concurrent role as a core investigator at the Center for Health Equity Research and Promotion (CHERP). He is also a faculty member at the Dorothy P. and Richard P. Simmons Center for Interstitial Lung Disease at UPMC and the VA deployment-related Respiratory Disease Clinic.

He earned his master's degree in public health with a focus on applied epidemiology from Emory University and completed a Clinical Research Informatics Postdoctoral (CRISP) Fellowship at UCSF. He specializes in managing sarcoidosis and other interstitial lung disease. His research focuses on leveraging real-world data from electronic health records (EHR) to study the impact of sarcoidosis heterogeneity and the role of environmental exposures on the natural history of the disease. Through his research, he aims to inform innovative clinical care for sarcoidosis patients and support evidence-based practices that improve clinical outcomes.

**Bhavika Kaul, MD, MAS**

Dr. Kaul is an investigator at the VA Center for Innovation in Quality, Effectiveness and Safety (IQuEst), staff physician in pulmonary and critical care medicine at the Michael E. DeBakey VA Medical Center, and Assistant Professor of Medicine at Baylor College of Medicine. Dr. Kaul's scholarship focuses on improving timely access to care for post-deployment Veterans with interstitial lung disease by leveraging "big data" generated from electronic health records to reduce missed opportunities for diagnosis, developing novel care delivery models to improve access to subspecialty care, and the thoughtful implementation of artificial intelligence tools for care pathway optimization.

Dr. Kaul earned her B.S. from Rice University and her M.D. from Baylor College of Medicine. She completed residency in internal medicine at Baylor College of Medicine, where she served as chief resident, and fellowship in pulmonary and critical care medicine at the University of California, San Francisco (UCSF), where she served as chief fellow. She completed additional advanced training in interstitial lung disease and health services research at UCSF and is board certified in internal medicine, pulmonary, and critical care medicine.



**03**



# **Education and Outreach**



## Education and Outreach

An important part of our work at the Airborne Hazards and Burn Pits Center of Excellence is to develop best practices and to disseminate education about airborne hazard exposures—for Veterans, their health care providers, and individuals in the medical and scientific community.

### Educating Providers

AHBPCE educated health care staff through WRIISC-HOME's provider education series. The WRIISC-HOME webinars and clinical briefs are accredited for both live and "enduring" offerings, meaning providers nationwide can have access to this training for several years and receive accreditation. Using the TrainingFinder Real-time Affiliate Integrated Network (TRAIN), the content is also available to community providers, other public health and government agencies (including DoD), and anyone who serves Veterans or active-duty service members. Attendees also receive continuing education credit.

Webinars presented this year:

- **"The AHOBPR at 10 Years: Looking back, looking forward"** was presented by Dr. Michael Falvo and Dr. Nisha Jani in June 2024. This presentation was part of WRIISC-HOME's webinar series and reached 280 attendees, including physicians, physician assistants, advanced practice nurses, nurses, social workers, and psychologists, among others.
- **"A Step-by-Step Guide for Working with Veterans with Airborne Hazards and Respiratory Concerns: The Deployment-Related Respiratory Disease Toolkit"** was presented by Dr. Anays Sotolongo in October 2024. This presentation was part of WRIISC-HOME's Military Exposures Clinical Briefs Series and reached 138 attendees, including physicians, physician assistants, advanced practice nurses, nurses, social workers, and psychologists, among others.

AHBPCE experts continued to maintain content on airborne hazards as part of a curriculum in post-deployment health available to VHA and community providers on demand for accreditation on TMS and TRAIN. These two modules are part of a larger certification program and ensure that health care professionals have the most up-to-date information on airborne hazards and related health concerns. This past year, 1,083 learners have taken the introductory module on airborne hazards, and 733 learners have taken the more advanced case study on airborne hazards and open burn pit exposure.

As part of our outreach efforts, AHBPCE communicated to providers regarding their use of the provider toolkit on Deployment-Related Respiratory Disease (DRRD). The toolkit serves as a clinical decision guide for providers who are evaluating patients with possible respiratory exposures. In collaboration with Dr. Katherine Bloeser and the Exposure-Related Care Transformation (EXPRT) Center, AHBPCE evaluated the DRRD toolkit through a two-phase process involving a survey of 48 clinicians and in-depth interviews with 12 clinicians. Findings revealed that the toolkit is used in primary care, pulmonology, and environmental health settings, with providers appreciating its format and step-by-step diagnostic approach.

AHBPCE, in partnership with WRIISC-HOME, continued to maintain a provider-focused toolkit on airborne hazards and open burn pits, which collates a variety of resources on airborne hazards, the Registry, and clinical evaluations and documentation. This toolkit is housed within the [WRIISC's SharePoint site](#) and is therefore available to all VA providers.

AHBPCE was highlighted twice in the EXPRT Digest, a monthly newsletter that is sent to thousands of VA providers across the country. Through this communication, the Center was able to communicate with the field about its various initiatives, including the Oscar Auerbach Visiting Scholar Program and dissemination of its 5-year report.

## Veterans and Stakeholders

Veterans remain the most important stakeholders within the Center. The Center continues to seek feedback and listen to Veteran concerns on airborne hazard and burn pit-related exposures and then develop information and education to respond to that feedback. The Center also develops educational resources and provides classes open to Veterans across the country to disseminate information. AHBPCE continues to maintain fact sheets on airborne hazards, available to Veterans and community members through the WRIISC's website.

AHBPCE collaborated with the Center for Healthcare Organization and Implementation Research (CHOIR), the EXPRT Center, and a Veteran cohort to develop a Veteran-facing toolkit on DRRD. This toolkit was developed as a companion to AHBPCE's provider toolkit on DRRD. The Veteran-facing toolkit provides education on airborne hazards and DRRD and walks Veterans through what they can expect when obtaining a workup and treatment for deployment-related respiratory disease. The toolkit was created with Veteran input through a co-design process, ensuring that the information is Veteran-centric and meets Veteran needs. It has three components—a webpage, a brochure, and a poster—and is available to use in an online format and printed brochure on [AHBPCE's website](#).

### What Are Airborne Hazards?

"Airborne hazard" refers to any sort of contaminant or potentially toxic substance that you are exposed to through the air you breathe. During your military service, you may have been exposed to airborne hazards such as:

- Smoke and fumes from open burn pits
- Chemicals, herbicides, and chemical warfare agents
- Sand, dust, and particulate matter
- General air pollution, common in certain countries
- Fuel, aircraft exhaust, and other mechanical fumes
- Smoke from oil well fires, burning debris, explosions, etc.

**Important:**  
If you are experiencing a serious medical problem, such as chest pain or difficulty breathing, call 911!

### Respiratory Symptoms & Diagnoses

**Were you exposed?**  
VA presumes that if you were deployed to certain locations within the Persian Gulf on or after August 2, 1990, then you may have been exposed to airborne hazards. Veterans may have been exposed to airborne hazards in other time periods and locations as well.

**If you were exposed, will you develop symptoms?**  
Exposure to airborne hazards may increase the likelihood of your developing a deployment-related respiratory disease, but it does not mean you definitely will. Most Veterans who were exposed to airborne hazards do not develop respiratory conditions. All Veterans who are concerned about exposure to burn pits or other airborne hazards should talk to their health care providers.

**What symptoms should you watch for?**  
Be aware of any changes to your health, no matter the severity or how ordinary they seem. A few common symptoms following airborne hazard exposure include coughing, burning throat, or itchy skin. You may experience no symptoms, one symptom, or several symptoms that arise long after your exposure. Talk with your healthcare team about any symptoms that occur.

**What are typical deployment related respiratory diagnoses?**  
Coughing, phlegm, or shortness of breath could be signs of a deployment related respiratory disease.

**VETERAN TIP**  
If you were treated for a condition while on active duty, it is still important to talk with your provider about your symptoms, including describing when they first started and any symptoms that are not going away with treatment.

### Assessments & Treatments

**What can you expect from your medical appointment?**  
There is no specific test for deployment related respiratory disease. Your healthcare provider will work with you to decide what conditions to evaluate based on your symptoms, exposure history, medical history including other health conditions, your family history, and other risk factors.

**What is the treatment for your symptoms?**  
Based on the test results, your provider may begin a treatment plan. The treatments for respiratory conditions are the same whether or not those conditions are caused by exposure to airborne hazards. That means you receive the same treatment for your asthma or other respiratory conditions as you would if there was no airborne hazard exposure. You can expect your provider to prescribe an evidence-based treatment for your diagnosed condition.

**VETERAN TIP**  
The VA may add more presumptive conditions. Be sure to talk with your provider, who can document symptoms and other concerns as they occur.

### Research on Airborne Hazards

There is ongoing research to better understand links between airborne hazards, symptoms, and diagnoses. The following resources about the latest research developments are available online.

- VA's Airborne Hazards & Burn Pit Center of Excellence (AHBPCE)
- Department of Defense, Congressionally Directed Medical Research Programs, Toxic Exposures Research Program (TERP)
- VA Office of Research and Development, Military Exposures Research Program (MERP)

**Resources**

**VETERAN TIP** State Veteran Service Officers can also help with identifying state benefits.

- How enroll in the VA
- Filing a disability claim
- Getting help from a Veterans Service Officer to file a claim
- Talking with a patient advocate
- The PACT Act
- The Airborne Hazards & Open Burn Pit Registry
- Talking with an Environmental Health Coordinator about local services and resources available to address your military exposure concerns
- The VA's Whole Health resources to support your overall health
- Lung health and related topics, including the NIH Breathe Better program

## The Deployment-Related Respiratory Disease Toolkit for Veterans

The WRIISC Advantage Newsletter is a Veteran-facing national newsletter published three times per year. The newsletter shares updates on the latest research, clinical, and education across all three WRIISC locations.

**The newsletter** featured two articles highlighting the Center and its research collaborations. The Summer 2024 newsletter highlighted the Center's virtual symposium, which reflected on a decade of impact of the Airborne Hazards and Open Burn Pit Registry and AHBPCE's contributions to monitoring and analyzing Registry data to support VA leadership and the field to continuously improve the Veteran and provider experience of the Registry examinations. The Fall 2024 newsletter highlighted the AHBPCE 5-year anniversary of being officially designated as a VA Center of Excellence by Congress and the President in Public Law 115-929. The article outlined the strides AHBPCE has made toward improving health outcomes for Veterans with military exposure-related concerns, including establishing the Post Deployment Cardiopulmonary Evaluation Network (PDCEN); facilitating asthma, rhinitis, and sinusitis as being recognized as presumptive service-connected symptoms of military exposures; releasing the Deployment-Related Respiratory Disease (DRRD) Toolkit for Providers; and more.

## Medical and Scientific Community

The AHBPCE is a leader in educating the medical and scientific community on new breakthroughs in research and treatment for deployment-related respiratory issues. The Center's experts presented the following research at conferences and annual meetings over the last year:

## Featured Conference Presentations & Speaking Engagements

03/2025

### **Invited Panel Speaker, 2025 Society of Toxicology**

"Protecting Those Who Serve: Advances in Military Environmental Exposures Research" (Lecture: "Have You Served in the Military, and Did You Experience Toxic Exposures? Approach to the Symptomatic Veteran) - Orlando, FL

8/4/2024

### **National Medical Association:**

"Addressing Military Environmental Exposure-Related Health Concerns

4/28/2025

### **American Occupational Health Conference:**

"Post-911 exposures: Karshi-Khanabad (K-2) Air-Base- Airborne Hazards"

5/6/2025

### **American College of Preventive Medicine Conference:**

"Military Environmental Exposures – Airborne Hazards"

See the full list of conference presentations and speaking engagements in [the appendix](#).



**04**



**Clinical Care**



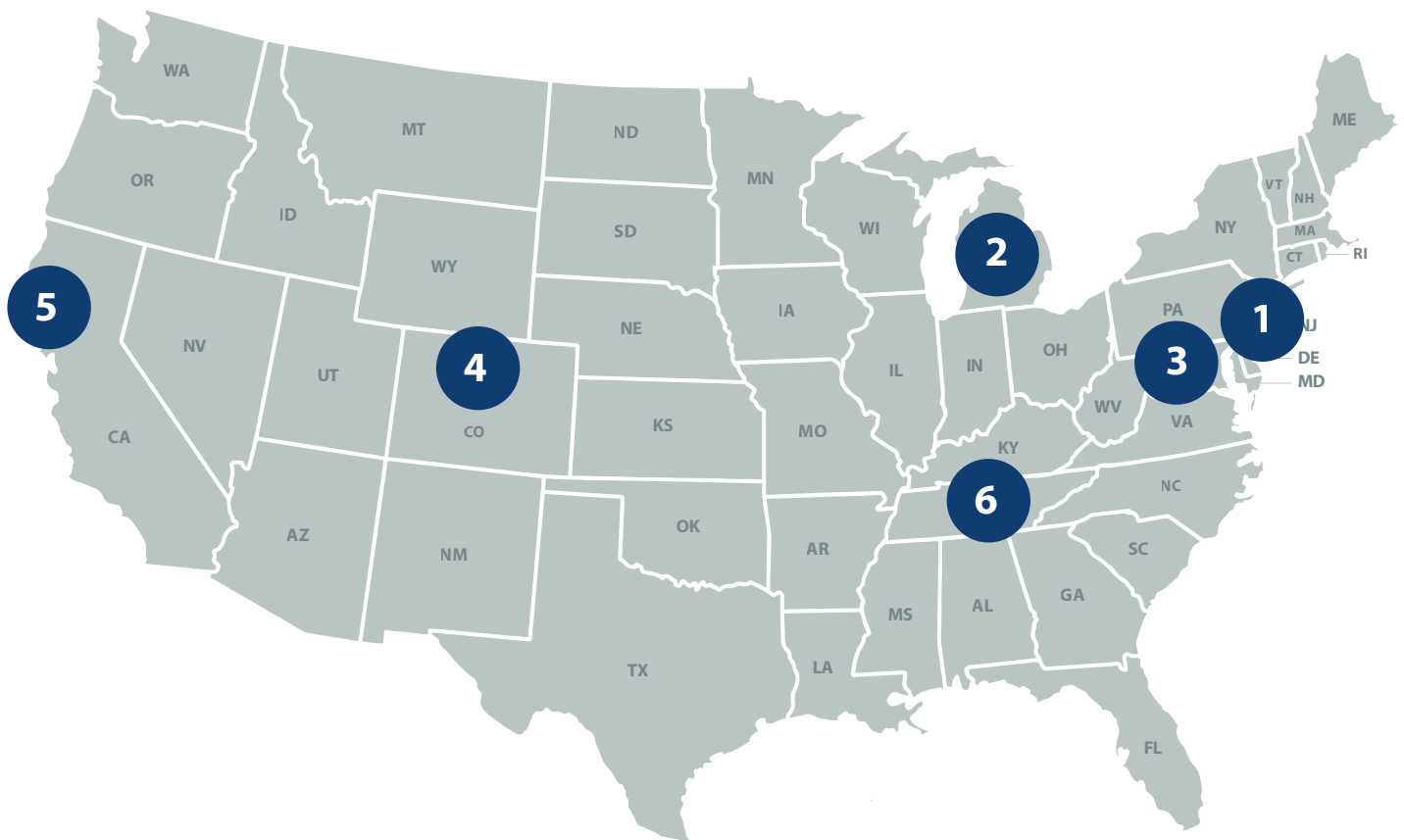
## Delivering Specialized Clinical Care

Clinical evaluations are conducted for certain Veterans with self-reported health concerns through the Airborne Hazards and Open Burn Pit Registry who have then been selected or referred by clinicians at other VA facilities for in-depth clinical assessments. Information from these evaluations is used to make management and treatment recommendations for individual Veterans, support research studies, and identify trends in health outcomes to improve care standards and treatment protocols.

### Post Deployment Cardiopulmonary Evaluation Network (PDCEN)

The Post Deployment Cardiopulmonary Evaluation Network (PDCEN) is a network of experts dedicated to furthering the understanding of deployment-related airborne hazard exposures.

The network was established by the Center of Excellence to develop clinical approaches, identify research questions, gather data, and conduct research that supports the development of new clinical care guidelines for Veterans who have been exposed to airborne hazards and burn pits.



The network currently consists of the following sites:



1

**VA New Jersey Health Care System, AHBPCE**

East Orange, NJ

**Site Directors:** Anays Sotolongo, MD, and Michael Falvo, PhD



2

**VA Ann Arbor Health Care System**

Ann Arbor, MI

**Site Director:** John Osterholzer, MD



3

**Baltimore VA Medical Center**

Baltimore, MD

**Site Director:** Danielle Glick, MD

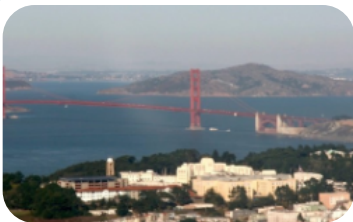


4

**Rocky Mountain Regional VA Medical Center**

Aurora, CO

**Site Director:** Silpa Krefft, MD, MPH



5

**San Francisco VA Health Care System**

San Francisco, CA

**Site Director:** Mehrdad Arjomandi, MD



6

**Nashville VA Medical Center**

Nashville, TN

**Site Director:** Bradley Richmond, MD, PhD

## Recent PDCEN Accomplishments

The PDCEN, in collaboration with the AHBPCE, continues to expand and provide standardized clinical evaluations across multiple sites. Our hybrid comprehensive evaluation plan has proven to be effective in delivering optimal care to Veterans.

Over the past year, we have ramped up recruitment. Our National Coordinators have conducted multiple site visits to maintain standard of care for Veterans and improve best practices. In line with our mission to disseminate knowledge learned from our program, we have maintained a strong presence at industry conferences, with multiple abstracts and presentations accepted at events. Additionally, we continue to publish research findings and host webinars, which are available for both providers and Veterans, including:

### Articles:

1. Dr. Osterholzer and team published a Perspective in the Annals of the American Thoracic Society entitled “A Quest for Answers in the Emerging Field of Post-Deployment Respiratory Health” describing his experience evaluating Veterans with post-deployment respiratory symptoms.
2. Dr. Osterholzer and team have a manuscript entitled “Sulfur dioxide exposure of mice induces peribronchiolar fibrosis — a defining feature of deployment-related constrictive bronchiolitis” accepted at PLOSOne.
3. Dr. Richmond and team published an article in Cardiovascular Pathology entitled “Pulmonary vascular disease in Veterans with post-deployment respiratory syndrome.”

### Presentations:

1. Dr. Richmond and Dr. Sotolongo presented an ATS Interactive Webinar entitled: “A burning question: Identifying and understanding Burn-pit Syndrome.”
2. Dr. Sotolongo and Dr. Krefft presented a WRIISC-HOME webinar entitled: “WRIISC-HOME: Understanding Deployment-Related Respiratory Disease Workup”
3. Dr. Arjomandi presented at the Pulmonary Division Clinic Conference with a presentation entitled: “Respiratory Hazards Associated with Military Service.”

Moving forward, the PDCEN is focused on increasing the number of Veterans we have seen. Our over-reaching mission is to continue to grow as a network to further support both providers and Veterans.

## PDCEN by the numbers

Chart  
Reviews

3,915

Clinic Invitation Letters/  
Invited for Program

873

Completed  
Phone Screen

516

Active  
Participants

116

**Total  
Completed**

**247**

*Total from 2019 – April 2025*

## Veteran Voices

In late May 2024, AHBPCE was honored to interview seven Veterans about their deployment experience, their experience with the Airborne Hazards and Open Burn Pit Registry, and their experience with the PDCEN. Each Veteran had been through a specialized clinical assessment at a PDCEN site and opted to share their story with VA providers, staff, and other Veterans who may have been affected by deployment-related airborne exposure.

The Center of Excellence is proud to work with Veterans across the country and continues to make efforts toward better health outcomes. The video can be viewed below:





**05**



# **The Registry**



## Putting Registry Data to Work for Veterans

The Airborne Hazards and Burn Pits Center of Excellence is responsible for the daily operations of the Airborne Hazards and Open Burn Pit Registry. We provide surveillance to monitor trends in the Registry regarding enrollment and self-reported health conditions. Additional VA data is merged with the AHOBPR to conduct clinical and large data research.

### Redesigned Registry

On August 1, 2024, the VA and Department of Defense (DoD) announced the launch of the redesigned AHOBPR. The redesigned Registry includes broadened eligibility criteria, automatic enrollment based on DoD records, and the ability for Veterans to opt out of participation if they wish. According to our Customer Relationship Management (CRM) team, the redesigned Registry has a low opt-out rate, resulting in a robust database of information for analysis.

Under the redesigned Registry, Veterans and service members who served in the following military campaigns or locations, per DoD records, are automatically enrolled in the updated Registry.

- Operations and Campaigns: Desert Shield and Desert Storm (ODS/S); Iraqi Freedom (OIF); Enduring Freedom (OEF); and New Dawn (OND).
- Iraq, Afghanistan, Kuwait, Saudia Arabia, Bahrain, Djibouti, Gulf of Aden, Gulf of Oman, Oman, Qatar, United Arab Emirates, waters of the Persian Gulf, Arabian Sea, Red Sea, Syria, Uzbekistan, and Egypt between August 2, 1990, and August 31, 2021
- Somalia since August 2, 1990
- The Southwest Asia theater of military operations and Egypt any time after August 2, 1990
- Afghanistan, Djibouti, Jordan, Lebanon, Syria, Uzbekistan, or Yemen any time after September 11, 2001
- Associated airspaces with the countries listed above as well as the waters of the Persian Gulf, Arabian Sea, Gulf of Aden, Gulf of Oman, and the Red Sea

The mission of the Registry, both in its legacy and redesigned forms, is to ensure the AHOBPR serves as a resource and facilitates collaborations among clinical and research experts to support the health and care of Veterans with military environmental exposures. A preliminary analysis, which will allow us to look at the Registry data in aggregate to find new solutions for treatment and care, is currently underway.

## Registry Operations

### Legacy AHOBPR

The information gathered from the legacy Registry is part of the redesign and will be used in analyses to help inform decisions related to airborne hazard-related health concerns.



**Outreach to eligible registrants:**

234,275

emails sent through VIRP



**New participants enrolled:**

517,025

As of 10/04/2024, there are  
**AHOBPR participants** (all duty status)



**New eligibility requests received:**

78,713 total

68,574

were deemed eligible



**Help desk tickets:**

200

completed

### Redesigned AHOBPR

#### CRM/opt out

6,468

CRM interactions total

<0.001%

opt out requests

## Executive Committee

This year, we established the Executive Committee. Led by AHBPCE under the HOME program office, the Executive Committee serves Veterans with military environmental exposures through strategic guidance and oversight of the Registry.

### Mission

The AHOBPR-EC is committed to ensuring the AHOBPR serves as a resource and facilitating collaborations among clinical and research experts to support the health and care of Veterans with military environmental exposure.

### Purpose

1. Provide oversight and management of the AHOBPR and ensure its data integrity.
2. Advance knowledge on the health effects related to airborne hazard exposures.
3. Develop and disseminate reports for Veterans, families, health care providers, and policy makers.
4. Provide recommendations to guidelines, operational processes, and resource allocation to address airborne hazard concerns.

### Membership

The AHOBPR-EC serves in a consultative capacity to the HOME Chief Consultant, who has ultimate responsibility for the management of the AHOBPR. Led by the AHBPCE, the AHOBPR-EC will consist of members with representation from VA Program/Office Leads, key stakeholders, and technical leaders. Membership for the initial charter may also include representatives from the following offices and groups:

- Health Outcomes Military Exposure (HOME)
- VA Office of Research and Development (ORD)
- Veterans Benefits Administration (VBA)
- Veterans Experience Office (VEO)
- Office of Enterprise Integration (OEI)
- Office of Health Ethics (OHE)
- National Data Systems (NDS)
- Board of Veterans Appeals (BVA)

## The AIMES Collaboration

The AIMES Collaboration, a joint initiative between the AHBPCE and IQuEST, helps improve the health and care of Veterans with airborne hazards concerns. The AIMES team brings expertise in data management and analysis, implementation science, and quality improvement to the management and use of the Registry.

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**AIMES**  
COLLABORATION

**AHBPCE** - Airborne Hazards and Burn Pits Center of Excellence

**IQuEST** - Center for Innovations in Quality, Effectiveness & Safety

**Military**

**Exposures**

**Surveillance**

This year, AIMES supported data of pending exams for each site as they completed their outreach in preparation for transition of AHOBPR exams to MEE assessments. As of April 9, 2025, there were 179,750 Airborne Hazards exams completed within the VA. There are currently no pending exams among participants.

Additional updates:

- **Implementation:** Monthly Clinical Report, performed site visits, supplied data education and data analysis of flag usage
- **Airborne Hazards Clinical Dashboard:** ongoing technical support, data validation, and usage training

## 10 Year Anniversary Symposium

In June 2024, the Airborne Hazards and Open Burn Pit Registry support and leadership team came together to discuss a decade of data, impact, and research. VA established the AHOBPR in 2014.

To commemorate this anniversary, AHBPCE and AIMES organized the 10 Year Anniversary Symposium. The event featured 16 speakers who presented on the Registry, their research using Registry data, and the future of the Registry.

**The presentations can be viewed here:**



# Registry Data Infographic

One of the aims of AHBPCE is to share Registry data with Veterans and the public. In October, AHBPCE completed an infographic depicting the differences between Early (1990-2001) and Late (2001-2024) deployers within the Registry.

## The Airborne Hazards and Open Burn Pits Registry (AHOBPR)

*A snapshot of participating Gulf War (Early Deployers) and Post-9/11 (Late Deployers) Veteran populations*

### Registry Participants by Year

### Most Recent Deployment

More than 20% of participating Veterans joined after the passing of the PACT Act in 2022.

### Deployment Locations

A majority of Veterans have deployed to more than one location or have been deployed to one location multiple times.

### Physical Limitations

The percentage of Veterans below responded that it is somewhat, very difficult, or that they can't do each of the tasks below.


### Self-Reported Diagnosis

Some of the most common conditions reported by Veterans are insomnia, wheezing/difficulty breathing, hypertension, allergies, chronic bronchitis and asthma.

Condition	Early Deployers	Late Deployers
Insomnia	89%	78%
Wheezing/ Difficulty Breathing	87%	86%
Hypertension	63%	36%
Allergies	53%	39%
Chronic Bronchitis	23%	11%
Asthma	21%	13%

### Deployment Exposures by Year

While both Early and Late deployers reported similar types of exposures, exposure type varies by group. Early deployers endorsed higher rates of ash, smoke, or oil fires exposures, while Late deployers endorsed more burn pit and blast exposures.

To learn more about the Registry, visit: 

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**Appendices**



## Appendices

### Acronym List

**AHBPC** – Airborne Hazards and Burn Pits Center of Excellence

**AHOBPR** – Airborne Hazards and Open Burn Pit Registry

**AHOBPR-EC** – AHOBPR Executive Board Committee

**AIMES** – Airborne Hazards and Burn Pits Center of Excellence Center for Innovations in Quality, Effectiveness & Safety

**BVA** – Board of Veterans Appeals

**CHOIR** – Center for Healthcare Organization and Implementation Research

**CDMRP** – Congressionally Directed Medical Research Program

**CRM** – Customer Relationship Management

**DoD** – Department of Defense

**DRRD** – Deployment-Related Respiratory Disease

**EHR** – electronic health records

**EXPR** – Exposure-Related Care Transformation Center

**fMRI** – functional MRI

**FOT** – Forced Oscillation Technique

**HOME** – Health Outcomes Military Exposure

**IQuEst** – VA Center for Innovation in Quality, Effectiveness and Safety

**LEAP** – Living Evidence Analysis Program

**LLM** – Large Language Model

**MEE** – Military Environmental Exposure

**NDS** – National Data Systems

**NJIT** – New Jersey Institute of Technology

**ODS/S** – Operation Desert Shield and Desert Storm

**OEF** – Operation Enduring Freedom

**OEI** – Office of Enterprise Integration

**OHE** – Office of Health Ethics

**OIF** – Operation Iraqi Freedom

**OND** – Operation New Dawn

**ORD** – VA Office of Research and Development

**PACT Act** – Promise to Address Comprehensive Toxics Act

**PDCEN** – Post Deployment Cardiopulmonary Evaluation Network

**SRDR+** – Systematic Review Data Repository

**TERP** – Toxic Exposure Research Program

**TMS** – Talent Management System

**TRAIN** – TrainingFinder Real-time Affiliate Integrated Network

**VADRR** – Veterans Affairs Data Repository Rutgers

**VBA** – Veterans Benefits Administration

**VEO** – Veterans Experience Office

**VHA** – Veterans Health Administration

**WOE** – Weight of Evidence

**WRIISC** – War Related Illness and Injury Study Center

## Publications

Chen PV, Christie IC, Godwin KM, et al. Barriers and Facilitators to Administering Burn Pit Registry Exams in VHA Facilities. *Mil Med.* 2024;189(9-10):e2153-e2162. doi:10.1093/milmed/usae175

- Phen S, Jani N, Klein-Adams JC, Ndirangu DS, Rahman A, Falvo MJ. Prevalence and Risk Factors of Post-Acute Sequelae of SARS-CoV-2 (PASC) among Veterans in the Airborne Hazards and Open Burn Pit Registry: A Prospective, Observational, Nested Study. *BMC Infectious Diseases*, 23:846 (2024).
- Boruch AE, Barhorst EE, Rayne TJ, Roberge GA, Brukadt SM, Leitel ZT, Coe CL, Fleshner M, Falvo MJ, Cook DB, Lindheimer JB. Exercise does not cause post-exertional malaise in Veterans with Gulf War Illness: A randomized, controlled, dose-response, crossover study. *Brain Behav Immun.* 2024 Aug;120:221-230. doi: 10.1016/j.bbi.2024.05.026. Epub 2024 May 20

## AHBPCE-Supported Publications

(Pilot Project Program Awardee) Almekdash MH, Han J, Guffey D, Christie IC, Helmer DA, Wu TD. Association of a Veterans Affairs Toxic Exposure Medical Evaluation with Symptom-Related Care. *Ann Am Thorac Soc.* Published online April 17, 2025. doi:10.1513/AnnalsATS.202408-835OC

(Pilot Project Program Awardee) Forbes LM, Bauer N, Bhadra A, et al. Precision Medicine for Pulmonary Vascular Disease: The Future Is Now (2023 Grover Conference Series). *Pulm Circ.* 2025;15(1):e70027. Published 2025 Jan 2. doi:10.1002/pul2.70027

(Pilot Project Program Awardee) Murray KE, Ratliff WA, Delic V, Citron BA. Gulf War toxicant-induced reductions in dendritic arbors and spine densities of dentate granule cells are improved by treatment with a Nrf2 activator. *Brain Res.* 2024;1823:148682. doi:10.1016/j.brainres.2023.148682

(Oscar Auerbach Visiting Scholar) Seedahmed MI, Albirair MT, Baugh AD, et al. Trends in All-Cause Mortality Among US Veterans With Sarcoidosis, 2004-2022. *Chest.* 2025;167(5):1416-1427. doi:10.1016/j.chest.2024.10.043

## Abstracts

- Colavito O, Pappas G, Samy B, Abitante TJ, Falvo MJ. Effect of kernel reconstruction on voxel-based image analysis of chest computed tomography scan. 2024 Annual Meeting Biomedical Engineering Society, Baltimore, MD.
- Phen S, Piskura NA, Pappas G, Alexander T, Klein-Adams J, Watson M, Wentz A, Ndirangu D, Domanski H, Sotolongo AM, Falvo MJ. Does the Change in RV Strain During Sub-maximal Exercise Contribute to Exercise Intolerance Among Post 9/11 Veterans With Airborne Hazards and Burn Pits Exposure? 2024 ATS Annual Meeting, San Diego, CA.
- Zeng S, Jani N, Sotolongo AM, Luo G, Arjomandi M, Falvo MJ. Pulmonary Function, Chronic Respiratory Symptoms, and Functional Limitation Among Veterans in the Airborne Hazards and Open Burn Pit Registry. 2024 ATS Annual Meeting, San Diego, CA.
- Cassady SJ, Glick DR, Hines SE, Krefft SD, Osterholzer JJ, Richmond BW, Arjomandi M, Sotolongo AM, Falvo MJ. Left ventricular concentric remodeling in veterans evaluated by the Post-Deployment Cardiopulmonary Evaluation Network. 2024 ATS Annual Meeting, San Diego, CA.
- Mainelis G, Han TT, Falvo MJ. Performance characteristics of the Aeroeclipse II nebulizer using a lung simulator. 2024 ATS Annual Meeting, San Diego, CA.
- Glick DR, Konikkara JJ, Sotolongo A, Alexander T, Diaz-Abad M, So J, Arjomandi M, Krefft S, Osterholzer JJ, Richmond B, Falvo MJ. Sleep Quality Among Post-9/11 Veterans with Exposure to Airborne Hazards. SLEEP 2024; Houston, TX.
- Devender HM, Riaz M, Alexander T, Konikkara J, Cassady SJ, Diaz-Abad M, Sotolongo AM, Arjomandi M, Krefft SD, Osterholzer JJ, Richmond B, Falvo MJ, Glick DR. Presence and impact of blast-induced traumatic brain injury on sleep health in post-9/11 Veterans. SLEEP 2025; Seattle, WA.
- Abitante T, Falvo MJ, Piskura N, Cassady S. Left Ventricular Concentric Remodeling In Deployed Post 9/11 Veterans and Effects On Exercise Performance. 2024 ACSM Annual Meeting; Boston, MA.
- Bell A, Ram S, Jagadev P, Falvo MJ, Pappas G, Osterholzer J, Galban CJ. Radiographic assessment of suspected deployment related respiratory disease with parametric response mapping. 2024 ATS Annual Meeting; San Diego, CA.
- Alexander T, Arjomandi M, Wilhite DP, Falvo MJ, Sotolongo AM, Osterholzer JJ, Krefft S, Glick DR, Cassady S, Richmond BW, and Post-Deployment Cardiopulmonary Evaluation Network. Classification of Exercise Intolerance in Formerly Deployed Veterans Varies Substantially with Choice of Reference Equation. 2024 ATS Annual Meeting; San Diego, CA.
- Christie IC, Klein-Adams J, Pappas G, Sotolongo AM, Alexander T, Ndirangu N, Jani N, Wu D, Wentz A, Eager N, Samy B, Falvo MJ, Sajja VS, Helmer DA. Prior blast exposure is associated with physical and affective components of dyspnea in US Veterans of Iraq and Afghanistan Deployments. 2024 Military Health Research Symposium.

- Christie IC, Alexander T, Ndirangu D, Klein-Adams J, Sotolongo AM, Jani N, Wu D, Domanski H, Watson MA, Aguilar J, Phen S, Piskura N, Falvo MJ, Sajja VS, Helmer DA. Multiple Correspondence Analysis of Self-Reported Blast Exposure in Deployed Veterans: A Preliminary Validation of Dimensional Structure and the Importance of What Can't Be Recalled. 2024 ATS Annual Meeting; San Diego, CA.
- Dahal S, Ramara KV, McCoy J, Mathew A, Wilder DM, Benton M, McLean VL, Falvo MJ, Helmer D, Long JB, Sajja VS. Longitudinal Functional and Pathological Assessment of Pulmonary Changes Associated with Low-level Repeated Blast Exposure 2024 ATS Annual Meeting; San Diego, CA.
- Ndirangu DS, Sotolongo AM, Falvo MJ, Rahman A, Jani N. Obstructive lung disease among veterans enrolled in the Airborne Hazards and Open Burn Pit Registry (AHOBPR) deployed to Join Base Balad and Iraq. 2024 ATS Annual Meeting; San Diego, CA.
- Woodbury ED, Sandstrom TK, Abid A, Miller RA, Schwieterman NA, Falvo MJ, Gorr MW, Wole LE. Time-course of systemic alterations in gene expression with co-exposure to particulate matter and stress. 2024 Society of Toxicology Annual Meeting; Salt Lake City, UT.

## Invited Lectures

03/2025

### **Invited Panel Speaker, 2025 Society of Toxicology**

"Protecting Those Who Serve: Advances in Military Environmental Exposures Research" (Lecture: "Have You Served in the Military, and Did You Experience Toxic Exposures? Approach to the Symptomatic Veteran) - Orlando, FL

05/2024

### **Invited Panel Speaker, 2024 ATS Annual Meeting**

"Research Careers in the Federal Government" - San Diego, CA

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