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**Welcome and  
Thank You for Attending**

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Mr. Grigoriy Shekhtman, Health Science Specialist – NJ WRIISC

Dr. Nicole Sullivan, Clinical Psychologist – NJ WRIISC



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*WRIISC – HOME FY 2024 Webinar Series Presentation*  
**Situational Awareness of Anomalous Health  
Incidents (AHI) for Providers**

Presentation for: VA and Community Clinicians and Partners

Presented by:

Robert Forsten, DO, MS, Senior Clinician and Psychiatry Consultant, DC WRIISC  
Louis French, PsyD, Neuropsychologist, Walter Reed National Military Medical Center, MD  
Jose “Joe” Ortiz, MD, MPH, Associate Director CETC and Senior OEM Consultant, DC WRIISC

Date of Webinar: May 14, 2024



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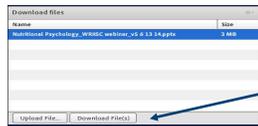


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## Tips and Pointers

- PowerPoint Presentation and handouts can be downloaded from Download Files Box.



1. Select material to be downloaded, now highlighted in blue.
2. Click on "Download File(s)" to download to your computer.

- Use Chat Box (at bottom) to ask questions.
- **1.0** contact hour is offered appropriately by ACCME, ACCME-NP, AAPA, ACPC, ANCC, APA, ASWB, CDR, NBCC, NYSED and JA IPCE to those attendees with 100% attendance.



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**Why should VA health care professionals become  
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Veterans **expect** VA health care professionals to know about military exposures.  
VA health care professionals **need** tools to respond to military exposure  
concerns.

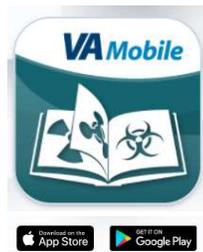


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## VA Mobile Exposure-Ed App

- For health care providers
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- Print or email tailored information for patients during or after the visit
- Locate VA facilities
- Available for free on Android and Apple devices
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- Comprehensive app details at: <https://mobile.va.gov>



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# Military Exposures Clinical Briefs Series

**2024 WRIISC-HOME Briefs Series**  
Every 4th Tuesday of each month  
12pm – 12:30pm EST

Thirty (30)-minute knowledge-based, interview-style briefs that converse with specific occupational groups to offer providers quick, hands-on skills to complement the more detailed learning found in our WRIISC-HOME Webinar Series.

**February 27, 2024:** [The Invisible Elephant: How to identify and address the most common military environmental exposures](#)

**March 26, 2024:** [Military Exposure Clues: How a Veteran's military occupation and history can help you identify and address military exposure concerns](#)

**April 23, 2024:** [Brain Cancer Mortality Among Gulf War I Veterans Exposed to Explosions at Khamisiyah](#)



Missed a session? Watch a previous Military Exposure Clinical Brief [here!](#)

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Second Thursday of each month  
1pm – 2pm EST

## Exposure-Informed Care as a Culture Shift Series

*The purpose of the Exposure Informed Care (EIC) Community of Practice call series is to provide an integrated multi-disciplinary curriculum to support the implementation of, and ongoing support for, Exposure Informed Care across the VA enterprise.*

March 14, 2024: History of Toxic Exposures During Military Service and Combat

April 11, 2024: History of VA Response to Veterans with Toxic Exposure Concerns

May 9, 2024: Providing Care for Veterans with Exposure Concerns: Past, Present, Future

June 13, 2024: Defining, Disseminating, and Implementing Exposure-Informed Care

July 11, 2024: Toxic Exposure Screening: Gateway to Exposure Informed Care

August 8, 2024: The Basics that Everyone Needs to Know about Exposure-Informed Care

September 12, 2024: Seamless Stepped Care for Veterans with Health Concerns Related to Exposures



[Sign up here for additional educational offerings on military environmental exposures](#)

# WRIISC-HOME FY24 Webinar Series

2024 Webinar Series - War Related Illness and Injury Study Center (va.gov)

Date	Webinar Title	Presenters
November 14, 2023	<b>WRIISC HOME Military Exposures and Care: Enhancing military culture competence to optimize Veteran-centered care</b> (Introductory: Special Topics)	Lucile Burgo-Black, MD, FACP: Co-Director Post Deployment Integrated Care Initiative; Stephen Hunt, MD, MPH: Director, Post Deployment Integrated Care Initiative; Andrea Kossoudji, MS, MBA, RN, AMB-BC: Nurse Educator (detailed), NJ WRIISC
December 12, 2023	<b>WRIISC HOME Deployment and Risk of Suicide Among Vietnam-Era Veterans: Forty years follow-up</b> (Advanced: Cognitive & Psychological Health)	Aaron Schneiderman, Ph.D.: Director Epidemiology, HOME; Julie Weitauf, Ph.D.: Clinical Psychologist, VA Palo Alto HS
January 9, 2024	<b>WRIISC HOME Examining the Impact of Military Environmental Exposures: Next steps for screening and treating</b> (Introductory: Exposures)	John Barrett, MD, MPH, MS, FAAFP, FACPM, FACOEM: Medical Director & Deputy Director, DC WRIISC; Michelle Kennedy Prisco, MSN, ANP-C: Deployment Health Clinician, Research & Educator, DC WRIISC
February 20, 2024	<b>WRIISC-HOME Clinical Guidance and Policies Related to PFAS Exposure in the Military</b> (Introductory: Exposures)	Terra Vincent-Hall, PhD: Senior Toxicologist, HOME
March 12, 2024	<b>WRIISC-HOME Understanding Deployment Related Respiratory Disease Workup</b> (Intermediate: Airborne Hazards)	Silpa Krefft, MD: Physician, National Jewish Health; Anays Sotolongo, MD: Co-Director AHBPCe, NJ WRIISC;
April 19, 2024	<b>WRIISC-HOME Chronic Multi-Symptom Illness (CMI)/Gulf War Illness (GWI): Veteran care and the 2021 Clinical Practice Guideline</b> (Introductory: CMI)	John Barrett, MD, MPH, MS, FAAFP, FACPM, FACOEM: Medical Director & Deputy Director, DC WRIISC; Robert Forsten, DO: Senior Clinician and Psychiatry Consultant, DC WRIISC; Charles C. Engel, MD, MPH: Core Investigator, COIN-VA Puget Sound
April 30, 2024	<b>WRIISC HOME Sleep Management with Mild-Traumatic Brain Injury &amp; Military Exposure Concerns</b> (Introductory: Cognitive & Psychological Health)	J. Wesson Ashford, MD, PhD (CA WRIISC, VA); J. Kent Werner, MD PhD CDR, MC, USN Assoc. Professor, Dept of Neurology (USUHS, DOD)
May 14, 2024	<b>WRIISC-HOME Situational Awareness of Anomalous Health Incidents (AHI) for Providers</b> (Introductory: Exposures)	Robert Forsten, DO: Senior Clinician and Psychiatry Consultant, DC WRIISC; Louis M. French, PhD, Neuropsychologist, Walter Reed National Military Medical Center, DC; Jose "Joe" M. Ortiz, MD, MPH, FACOEM, Associate Director CETC and Senior OEM Consultant, D.C. WRIISC
June 11, 2024	<b>WRIISC-HOME The AHOBPR at 10 Years: Looking back, looking forward</b> (Introductory: Airborne Hazards)	Michael Falvo, PhD: Co-Director AHBPCe, NJ WRIISC; Nisha Jani, PhD, MPH: Health Science Specialist, NJ WRIISC AHBPCe
July 9, 2024	<b>WRIISC-HOME Impact of Deployment-Related Exposures on Women's Health</b> (Introductory: Exposures)	Maheen M. Adamson, PhD, MHL (WRIISC-WOMEN), CA; Jennifer Jennings, MD (WRIISC-WOMEN), CA
August 13, 2024	<b>WRIISC-HOME Radiation as a Military Exposure</b> (Introductory: Exposures)	Danny McClung, BS, RRPT, FHPS: Health Physicist and Radiological Consultant, HOME; Peter Rumm, MD, MPH, FACPM: Director, Policy Military Environmental Exposures, HOME; Rudolph Tacoront, MD: Staff Physician, San Diego VA Health System
September 10, 2024	<b>WRIISC-HOME An Update on Yoga as a Treatment for Chronic Symptoms of Gulf War Illness</b> (Introductory: CMI)	Peter Bayley, PhD: Director of Research, CA WRIISC; Louise Mahoney, MS: Yoga Therapist and Co-investigator, CA WRIISC



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# WRIISC-HOME TMS & TRAIN Collections: Webinars, Podcasts and Briefs

## COLLECTION 1: E-Learning



## COLLECTION 2: Airborne Hazards



## COLLECTION 3: Exposures



## COLLECTION 4: Gulf War Illness



## COLLECTION 5: Chronic Multi-symptom Illness



## COLLECTION 6: Whole Health/Integrative Functional Medicine



## COLLECTION 7: Cognitive & Psychological Health



## COLLECTION 8: Special Topics



## COLLECTION 9: Podcasts



## COLLECTION 10: ME Clinical Briefs



[WRIISC\\_ProviderEducationResources.pdf \(va.gov\)](#)



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## TODAY'S WRIISC TRAINING

**PURPOSE:** to increase provider knowledge by sharing updates on best practices, which in turn, also supports the need for higher learning and understanding of Anomalous Health Incidents (AHI). This training is appropriate for interprofessional health care teams.



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## Presenter

### **Robert D. Forsten, DO, MS**



Dr. Forsten joined the VA in October 2020 after retiring from the US Army with over 30 years of US military service. He transferred to the Washington DC VA War Related Illness and Injury Study Center (WRIISC) in November 2022. Dr. Forsten has held numerous O6 level commands and served in staff officer surgeon roles at the three- and four-star levels. He has deployed to Iraq, Afghanistan and in support of a U.S. Humanitarian mission. Dr. Forsten was also the Command Psychiatrist for US Army Special Operations for six years.

Dr. Forsten is a graduate of the US Army War College with a Master of Strategic Studies and is a diplomat of the American Board of Psychiatry and Neurology. He is a Clinical Associate Professor for the Uniformed Services University of the Health Sciences, F. Edward Herbert School of Medicine, Bethesda, MD. In addition to AHI, his scholarly interests also include PTSD, TBI, Substance Use Disorders, Sleep Disorders, and Chronic Multisystem Illness with over 30 peer-reviewed journal articles and book chapters.



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## Presenter

### Louis M. French, PsyD



Dr. French is Deputy Director at the National Intrepid Center of Excellence (NICoE), at the Walter Reed National Military Medical Center. He is responsible for overseeing all aspects of the screening, assessment, and rehabilitation of those with TBI at the flagship military treatment facility in the DoD network. He is Professor of Physical Medicine and Rehabilitation at the F. Edward Hebert School of Medicine at the Uniformed Services University of the Health Sciences.

Dr. French received his doctorate in Clinical Psychology, from the George Washington University. He completed fellowships in Clinical and Experimental Neuropsychology at the National Institute of Mental Health, and in Neuropsychology, focusing on Traumatic Brain Injury, at the Defense and Veterans Brain Injury Center at Walter Reed Army Medical Center.

He has published over 160 peer-reviewed journal articles and book chapters in the area of military TBI and neuropsychology and has been recognized as the most published author in the nation for military or veterans mTBI research over the previous decade. In 2022, Dr. French was awarded the Department of Defense Medal for Distinguished Civilian Service, DoD's highest civilian honor.



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## Presenter

### Jose “Joe” M. Ortiz MD, MPH, FACOEM



Dr. Joe Ortiz joined the VA in August 2023 after retiring from the US Army with over 30 years of US military service. Dr. Ortiz has held numerous leadership positions in the Army, including as the Occupational Health and Environmental Medicine Consultant for the Army Surgeon General from 2018 - 2022. He has deployed to Afghanistan, Kosovo, and Croatia/Hungary/Bosnia in support of a U.S. Military missions. Dr. Ortiz was also the Command Surgeon for the US Army Field Support Command/Joint Munitions Command for 3 years.

Dr. Ortiz is a graduate of the US Army Intermediate Level Education (ILE), an Occupational Medicine diplomat of the American Board of Preventive Medicine, and a Fellow for the American College of Occupational and Environmental Medicine. He completed his undergraduate studies at Duke University and his medical studies at the F. Edward Hebert School of Medicine at the Uniformed Services University of the Health Sciences, where he still serves as an Assistant Professor.



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## Facilitator



### Grigoriy Shekhtman

Health Science Specialist, BA

Grigoriy Shekhtman is a Health Science Specialist with the NJ WRIISC. Mr. Shekhtman joined the WRIISC in December 2021 and supports its Education Mission by assisting with educational resources and efforts for Veterans and their Providers.

Mr. Shekhtman brings over 5 years of research experience to the WRIISC. Prior to joining the WRIISC Education team, he worked with the WRIISC Research team by recruiting study participants and collecting research data. Mr. Shekhtman earned his BA in Psychology from Seton Hall University and is continuing his education there for a MS in Experimental Psychology.



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# Havana Syndrome

## *Situational Awareness of Anomalous Health Incidents (AHI) for Providers*

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Senior Clinician and Psychiatry Consultant  
D.C. War Related Illness and Injury Study Center  
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Welcome everyone and thanks for joining us today to discuss Havana Syndrome and Anomalous Health Incidents or AHI. I included “Situational Awareness” in the title with the expectation that today’s talk will improve your recognition of suspected AHI cases to make informed decisions with these patients.

## Disclaimers and Disclosures

Disclaimers: The views expressed in this webinar are those of the presenters and do not necessarily reflect those of the Department of Veterans Affairs, Department of Defense, or any other institutions or government agencies.

Disclosures: no disclosures and no conflicts of interest.



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## Acknowledgements

- We are grateful to the numerous providers below who contributed to this presentation:
  - CAPT Scott A. Cota, MD
  - Bryan R. Smith, MD
  - Randel L. Swanson II, DO, PhD
  - David L. Brody, MD, PhD
  - Casey Becker BSN, RN, CBIS
  - Miriam Roth MS, PA-C
  - Thomas P. Chacko, PhD
  - Joint Trauma System Team for AHI Registry



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## VETERANS MATTER

We give earnest thanks to our Veterans for their service, protection, loyalty, strength and courage. Most of all, we give them most honor for providing Americans with the often taken for granted opportunity of feeling safe, by overall not fearing, to walk out of our homes every day.



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This slide speaks to our those that kept our country safe WHILE they served AND to our Servicemembers that continue to do so today who will also be Veterans one day. Doctors Forsten, French and Ortiz and I, thank all of you in the audience who care for our Veterans.

### Level 3 Learning Objectives

- Increase provider knowledge, expand clinical care and share best practices so providers understand AHI
- Understand the clinical presentation of AHI
- Review evaluation and treatment
- Also review:
  - evaluation using the AHI Acute Assessment Form
  - DHA recommended treatment and referral strategies



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Our Level 3 Learning Objectives for this talk are:

- To increase knowledge, clinical care and share best practices
- To understand the clinical presentation
- And to review the evaluation and treatment of AHI
- We will also discuss the DHA, Defense Health Agency, Form 244 and DHA treatment and referral strategies.

NEXT SLIDE PLEASE

- 
- Provide guidance for evaluating a patient who reports an AHI exposure using the Anomalous Health Incident (AHI) Acute Assessment form (DHA Form 244)
  - Apply DHA recommended treatment and referral strategies using the Progressive Return to Activity (PRA) Following Acute Concussion/Mild TBI

## OVERVIEW

- Background of Havana Syndrome
- Reported Symptomatology
- Skepticism and Criticisms
- Scientific Studies & Evidence Gathering
- Emerging Consensus and Legislative Actions
- Management Strategies
- Future Research Directions



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## CASE STUDY: Possible EMF Exposure in a Veteran

- Mr. B reports “high-power microwave” exposure
  - transmitting data satellite
  - headaches, nausea, and felt hot
  - cognitive sequelae beginning 5-10 years ago
    - progressive decline worse in last 5 years
    - concerned exposure related for VBA
  - worsening over the past 5 years
    - also h/o thyroid disease, HLD, OSA, depression, anxiety, and insomnia
      - using OTC Unisom for insomnia



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Let's start with the clinical portrait of a veteran, who reports exposure to a high-power microwave while stationed overseas. He was evaluated earlier this year at the Washington D.C. WRIISC Complex Exposure Threats Center or CETC. Dr. Ortiz will talk more about the CETC later. Mr. B reports that in 2008, he stood in front of a data satellite while it was transmitting. He notes quote unquote “it microwaved my brain for 15-20 min”. He reports onset of a headache, nausea, and feeling hot before realizing the microwave was on. These symptoms were brief except he noted having a HA on and off for about 10 days after. But he reports worsening cognition over the last 5-10 years, but he can't pinpoint an exact date of onset, so, at a minimum, his cognitive issues were first noted at least 6 years after the exposure. He reports continued cognitive decline...and is concerned it is related to his microwave exposure. He is claiming a brain injury with the VBA for service connection. He also has a medical history of thyroid disease and hyperlipidemia, both controlled, as well as Obstructive Sleep Apnea, depression, anxiety, and insomnia and he's using an over the counter medication listed on the slide.

SO..., many of you in the audience are in primary care, and you have about 20 minutes with this patient. What is your reaction to this patient and how might you proceed? As we discuss AHI today, think about how you will approach the visit, pertinent questions for evaluation and later follow-up for continued care for Mr. B.

## What is AHI?

- US government term
- A constellation of unexplained symptoms
  - audio-vestibular sensory phenomena that State Department, DoD and other personnel have reported since 2016
- Also referred to as:
  - Havana syndrome
  - Unconventionally-acquired Brain Injury (UBI)
- No known etiology
  - pulsed radiofrequency radiations?
    - 4 classes in the military for use
    - attacks by unidentified foreign actors?
  - not associated with any specific neurological abnormality
    - pesticides and toxins?
    - mass psychogenic illness?



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AHI is a government term for a collection of unexplained and sudden symptoms including acute onset of audio-vestibular sensory phenomena reported by members of the State Department, DoD and other various organizations since 2016 (and now suspected even before 2016). AHI is also known as Havana syndrome, and UBI. Currently, AHI lacks a known etiology but might be related to exposure to directed pulsed radio frequency energy or microwave energy or electromagnetic fields. Military devices are classified in four main classes according to their intended use: communication devices, localization and surveillance devices, jammers.... and Electro-magnetic directed-energy weapons. There's been speculation of attacks by these weapons. AHI has not been associated with any specific neurological abnormality and other theories have considered other possibilities like pesticides or toxins. Lastly, although "mass psychogenic illness" was used in the intelligence report that Dr. French will discuss later, this term is imprecise, and is not widely used in today's U.S. scientific literature. And, it fails to discern between the acute onset and continuation of symptoms seen in AHI.

Also, there is no evidence that if you're smarter, better trained, motivated, etc. that you're more resistant to psychogenic illness. Second, you're right about mass psychogenic illness tending to be transient with an improving course.

However, in somatoform disorders as we conceptualize them now, people trend towards worsening without intervention

(TBI better over time; somatoform worse over time). or mass psychogenic illness (however, mass psychogenic illness is often associated with transient, benign symptoms with rapid onset, unlike AHI and I believe that it is likely due to the nature of the people targeted, all are high functioning and extremely dedicated personnel that want to continue their mission and the behavioral health symptoms of depression, anxiety and insomnia that occur when not permitted to do so due to being recalled to CONUS or medically incapable may look like mass psychogenic illness but isn't

## BACKGROUND: Embassy Incidents/Patient Experiences

- Sudden-onset neurologic, otologic, and ophthalmologic symptoms
- First reported in 2016 but some individuals later reported more remote incidents
- 200+ individuals reporting incidents in total
  - initially from Havana; then a year later in China
  - US embassy employees at their homes, often near the embassy
  - reported in the embassy itself
- More broadly
  - Vienna, London
  - DC
- Almost all instances at home
  - occasionally at worksite
  - others while driving
  - at least one while exercising
- Similarities between AHI symptoms and mTBI



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Embassy incidents. Spontaneous and idiopathic neuro, ear and eye symptoms were experienced and reported by U.S. embassy staff, mainly from the State Department, while serving in Havana in 2016 as well as involvement of U.S. intelligence and military personnel and their families. They reported directional and multisensory exposures with unusual auditory and tactile stimuli of variable intensity and character. There were multiple reports of concussion-like symptoms from 2016 to 2018 with symptoms of auditory and/or vestibular problems such as hearing loss, tinnitus, vertigo, and headache, as well as cognitive difficulties such as memory loss, and disorientation. But....some had onset of complex neurological symptoms within 24 hrs and persisting beyond 3 months. These are just some of the reported areas this has occurred, there are at least a half dozen more locations as well as occurring at home or work locations. There are similarities between AHI symptoms and mild TBI postconcussive symptoms that I will touch on later. But the bottom line to take away from this slide is that AHI may still be occurring so consider it if you experience a patient presenting with this history while serving abroad or in an organization for our government that may be targeted.

## AHI Unknowns

- **All currently unknown:**

- prevalence
  - population or war cohort
  - clinical practice
- cause
  - high-power nonionizing directed energy
    - known to cause burn and other injuries
    - effects and use
- relationship to MUPS, PTSD, somatoform, TBI
- explanatory diagnoses?



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Although AHI has been widely reported in the media, much about it remains unknown. As you can see, the prevalence in the general population, war cohort and those personnel in various government positions remains unknown. Although there are thousands of animal studies, but there's NOT much known about the cause of AHI in relation to energy weapons in humans...yet we know these weapons can and do cause burns and other injuries, but their long-term effects and their use in warfare have not been openly discussed. AHI may be related to medically unexplained physical symptoms, or PTSD. And, most of you know somatoform disorder was changed to Somatic Symptom Disorder in DSM5 but still understand the term. Or, is it related to TBI since the NASEM reported that people suspected of having AHI quote/unquote "...appeared to have sustained injury to widespread brain networks without an associated history of head trauma." And lastly, as providers, we naturally want to know what establishes an 'explanatory diagnoses" but this is also unknown for AHI.

AHI Presentation and Symptoms	
<ul style="list-style-type: none"> <li>• <b>Reported sensory events</b> <ul style="list-style-type: none"> <li>–loud sounds               <ul style="list-style-type: none"> <li>• unilateral or bilateral</li> <li>• chirping, screeching or clicking</li> </ul> </li> <li>–pressure</li> <li>–heat</li> <li>–vibrations</li> </ul> </li> <li>• <b>Reported symptoms</b> <ul style="list-style-type: none"> <li>–immediate or gradual onset</li> <li>–sense of Localization</li> </ul> </li> </ul>	<p><b>Persistent or recurrent:</b></p> <ul style="list-style-type: none"> <li>-Dizziness</li> <li>-Headache</li> <li>-Fatigue</li> <li>-Impaired balance</li> <li>-Impaired concentration</li> <li>-Impaired memory</li> <li>-Sleep disturbance</li> <li>-Depression</li> <li>-Irritability</li> <li>-Nervousness</li> <li>-Visual disturbance</li> <li>-Hearing changes</li> </ul>

As you can see, there are many different presentations and symptoms reported in AHI for initial reported sensory events and then later persistent symptoms. Dr. Ortiz, as you saw in his introduction, is an Occupational and Environmental Medicine physician or OEM doc. As an OEM, he told me a key point about AHI, and it's that these cases start with the symptoms...and then challenge providers to work "backwards" to identify potential exposures. Typically, OEM starts with a known exposure and then seeks ways to prevent illness and then control exposures using PPE, or Personal Protective Equipment, substitution, or engineering controls. With AHI, there may be "known and unknown" exposures given what is suspected, and reported and suspected, and unreported or unknown altogether

## Multiple Investigations and Some Published Manuscripts

### Scientific

- JAMA papers (Penn and NIH)
- National Academy of Science and Medicine
- CDC
- Jason group
- Dalhousie, Miami, DoD
- Penn follow-up
- WRIISC

### Intelligence

- IC Scientific Panel
- ODNI



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# STUDIES

March 20, 2018

## Neurological Manifestations Among US Government Personnel Reporting Directional Audible and Sensory Phenomena in Havana, Cuba

Randel L. Swanson II, DO, PhD<sup>1,2</sup>, Stephen Hampton, MD<sup>1,2</sup>, Judith Green-McKenzie, MD, MPH<sup>2,3</sup>, Ramon Diaz-Anastasia, MD, PhD<sup>2,4</sup>, M. Sean Grady, MD<sup>2,5</sup>, Ragini Verma, PhD<sup>2,6</sup>, Rosette Blester, PhD<sup>2</sup>, Diana Duda, PT, DPT<sup>2,7</sup>, Ronald L. Wolf, MD, PhD<sup>2,8</sup>, Douglas H. Smith, MD

> Author Affiliations | Article Information

JAMA. 2018;319(11):1125-1133. doi:10.1001/jama.2018.1742

JAMA

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Science  
Engineering  
Medicine

Consensus Study Report

**An Assessment of Illness in U.S. Government Employees and Their Families at Overseas Embassies**  
(2020)

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National Academy of Medicine

July 23/30, 2019

## Neuroimaging Findings in US Government Personnel With Possible Exposure to Directional Phenomena in Havana, Cuba

Ragini Verma, PhD<sup>1,2,3,4,5</sup>, Randel L. Swanson, DO, PhD<sup>5,6,7,8</sup>, Drew Parker, BS<sup>1,2,4</sup>, et al.

> Author Affiliations | Article Information

JAMA. 2019;322(4):336-347. doi:10.1001/jama.2019.9269

JAMA

## CUBA UNEXPLAINED EVENTS INVESTIGATION – FINAL REPORT

Havana, Cuba, August 2016 to March 2019

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## 2018 Penn JAMA Paper

**Table 2. Exposure Descriptions of the Directional Phenomena**

Patient No.	Associated Sound			Associated Sensory Stimuli				Duration >3 mo		
	Reported	High Pitch	Low Pitch	Reported	Pressure	Vibration	Movement Attenuation <sup>a</sup>	Persistent Symptoms	Objective Findings	Required Treatment
1	X	X					X	X	X	X
2	X	X					X	X	X	X
3	X	X					X			
4	X		X	X		X		X	X	X
5	X	X		X	X			X	X	X
6	X		X	X	X		X	X	X	X
7				X	X		X	X		
8	X	X					X	X	X	X
9	X	X		X		X		X	X	X
10	X	X		X		X		X	X	X
11	X	X		X	X			X	X	X
12	X	X		X	X			X	X	X
13	X	X					X	X	X	X
14	X	X					X	X	X	X
15	X	X		X	X		X	X	X	X
16	X	X					X	X	X	X
17	X	X		X	X		X	X	X	X
18								X	X	X
19	X	X		X	X			X		
20				X	X		X	X	X	X
21	X	X						X	X	X
No. (%)	18 (86)	16 (76)	2 (10)	12 (57)	9 (43)	3 (14)	12 (57)	20 (95)	18 (86)	18 (86)

<sup>a</sup> Patients reported attenuation of sound, pressure, or vibration when moving to a different location.



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Distinct direction from which the sensation emanated (hereafter referred to as directional phenomena).

## JAMA Editorials 2018

- “The **prevalence of convergence insufficiency** (characterized by a decreased ability to move the eyes toward each other when attempting to focus on a near target), has been reported to range from **1% to 33% ... among healthy individuals.**
- Many of the symptoms described **also occur in other medical, neurological, or psychiatric conditions.** Persistent postural-perceptual dizziness (PPPD) is a syndrome characterized primarily by chronic symptoms of dizziness and perceived unsteadiness, often triggered by acute or chronic vestibular disease, neurological or medical illness, or psychological distress
- Despite the differences in advanced neuroimaging metrics between patients and controls reported in this study, **the clinical relevance of these differences is uncertain**, and the exact nature of any potential exposure and the underlying etiology of the patients’ symptoms still remain unclear”

(Muth CC et al.)



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An Assessment of Illness in U.S. Government Employees and  
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“this constellation of clinical features is unlike any disorder in the  
neurological or general medical literature”

“the committee felt that many of the distinctive and acute signs,  
symptoms, and observations reported by DOS employees are  
consistent with the effects of directed, pulsed radio frequency (RF)  
energy”



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## NIH JAMA 2024 (two manuscripts)

Research

JAMA | Original Investigation

### Clinical, Biomarker, and Research Tests Among US Government Personnel and Their Family Members Involved in Anomalous Health Incidents

Leighton Chan, MD, MPH, Mark Hallett, MD, Chris K. Zaleski, PhD, Carmen C. Brewer, PhD, Cris Zampieri, PhD, Michael Hoa, MD, Sara M. Lippa, PhD, Edmond Fitzgibbon, MD, Louis M. French, PsyD, Anita D. Moses, MSN, Andrie J. van der Merwe, BS, Carlo Pierpaoli, MD, PhD, L. Christine Turzco, MD, PhD, Srinige Yonker, MD, Pashtun Shahin, MD, PhD, and the NIH AHI Intramural Research Program Team

**eTable 7. Demographic and Clinical Characteristics of the Study Participants**

Characteristics	Cuba	China	Vienna	USA	Other
N	24	6	17	9	30
Age, mean (SD)	45.9 (10.0)	40.5 (13.7)	40.4 (9.6)	41.2 (7.1)	40.6 (7.1)
Sex, F:M	13:11	3:3	7:10	6:3	13:17
Education from first grade, year, mean (SD)	17.3 (2.0)	17.0 (1.7)	17.1 (1.8)	18.1 (2.2)	16.6 (1.7)
US government employee family member, N (%)	0 (0)	1 (17)	2 (12)	0 (0)	7 (23)
Reduced capacity and/or unable to work due to AHI, N (%)	11 (46)	3 (50)	3 (18)	2 (22)	9 (30)
Days from first incident to evaluation, median (range)	681 (23-1495)	268 (55-746)	35 (6-155)	53 (1-325)	39 (5-657)
Sound or Pressure, N (%)	22 (92)	5 (83)	15 (88)	7 (78)	21 (70)
Directionality and/or Locality, N (%)	18 (75)	3 (50)	15 (88)	6 (67)	17 (57)
FND, N (%)	10 (42)	6 (100)	2 (12)	2 (22)	4 (13)

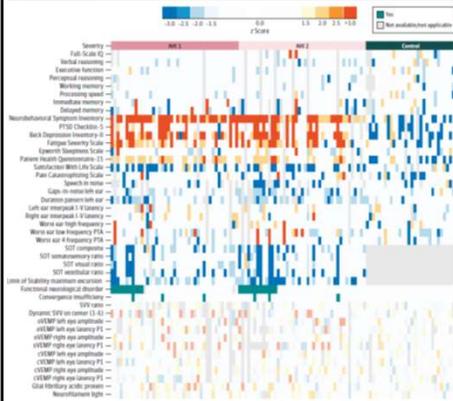


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## NIH JAMA 2024

Figure 5. Summary Measures of the Blood Biomarkers, Vestibular, Balance, Hearing, and Self-Reported Symptoms and Neuropsychological Measures Across Individual Participants



- Participants were often in significant distress and had significantly increased fatigue, depression, posttraumatic stress, imbalance, and neurobehavioral symptoms compared with the control participants.
- There were no significant differences between participants with AHIs and controls in most tests of auditory, vestibular, cognitive, or visual function as well as levels of blood biomarkers.
- Group comparisons were made. Some subjects showed variable performance.
- Functional neurological disorders play a significant role in symptom expression.
- Reassurance about lack of evidence of brain dysfunction.



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## IC Experts Panel

Declassified 1FEB 2022

- ***The signs and symptoms of AHI are genuine and compelling.***

“Prompt medical evaluation and care is particularly important; many individuals who have been treated immediately after and even have improved.”

- ***A subset of AHIs cannot be easily explained by known environmental or medical conditions and could be due to external stimuli.***

“Although some signs and symptoms of AHIs are common in known medical conditions, the combination of four core characteristics is distinctly unusual and unreported elsewhere in the medical literature, and so far have not been associated with a specific neurological abnormality.”

- ***Pulsed electromagnetic energy, particularly in the radiofrequency range, plausibly explains the core characteristics, although information gaps exist.***

- ***Ultrasound also plausibly explains the core characteristics, but only in close-access scenarios and with information gaps.***

- ***Psychosocial factors alone cannot account for the core characteristics, although they may cause some other incidents or contribute to long-term symptoms.***

- ***Ionizing radiation, chemical and biological agents, infrasound, audible sound, ultrasound propagated over large distances, and bulk heating from electromagnetic energy are all implausible explanations for the core characteristics in the absence of other synergistic stimuli.***



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## ODNI Report of 2023

- The IC pursued three separate lines of inquiry:
  1. Involvement of a foreign adversary in the incidents?
  2. Feasibility and existence of deliberate mechanisms that an adversary might use.
  3. Can medical analysis help determine if an outside actor is involved in the symptoms associated with AHIs?
- Agencies ... explored a range of potential indicators of hostile activity, from identifying suspicious persons near incident sites to searching for a pattern among affected personnel.



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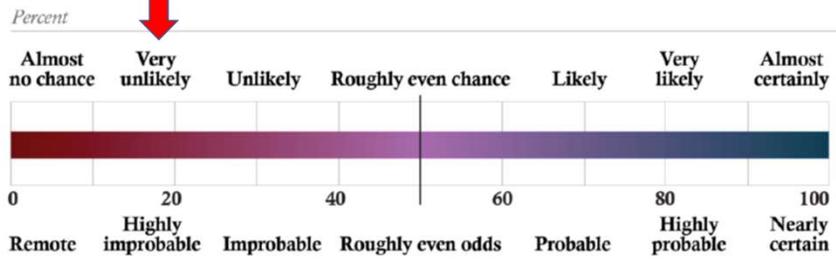
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# Intelligence Community Assessment

## (U) Judgments of Likelihood

(U) The chart below approximates how judgments of likelihood correlate with percentages. Unless otherwise stated, the Intelligence Community's judgments are not derived via statistical analysis. Phrases such as "we judge" and "we assess"—and terms such as "probable" and "likely"—convey analytical assessments.



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## IC ASSESSMENT CONCLUSIONS

- **“Very unlikely” a foreign adversary is responsible for the reported AHIs.**

IC agencies have varying confidence levels (two agencies at moderate-to-high confidence; three are at moderate confidence; two at low confidence)

- **“Deliberate causal mechanisms are very unlikely to have caused the sensory phenomena and adverse symptoms associated with AHIs”**
  - IC agencies have varying confidence levels (two agencies at high confidence; three agencies have moderate confidence)
  - Two agencies judge that deliberate causal mechanisms are unlikely as a cause but low confidence because they judge that radiofrequency (RF) energy is a plausible cause for AHIs



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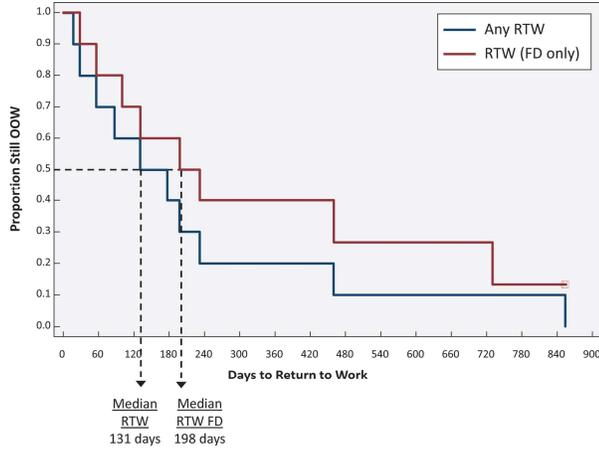
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## CHRONIC SYMPTOMS IN PENN POPULATION



Of the 45 employees referred to Occupational Medicine, the mean age was 42.5 years, 60% were men, 68% were never out of work, 22% were out of work for some period, and 15% remain out of work at 28 months. Vestibular, cognitive, hearing, sleep, and visual symptoms, and a higher initial symptom score were significantly associated with work inability while psychiatric symptoms were not.

Represents 10 observations. Open squares represents censored observations (n=2, for RTW fully duty).

Clinical and Psychological Factors Associated With Return to Work Among United States Diplomats Who Sustained a Work-Related Injury While on Assignment in Havana, Cuba  
Green-Mckenzie, Judith; Shofer, Frances S.; Mathei, Jarrod; Biester, Rosette; Deibler, Marla  
Journal of Occupational and Environmental Medicine 64(3):212-217, March 2022.



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## CHRONIC SYMPTOMS IN PENN POPULATION

- A cohort of 20+ had prolonged rehab therapies at Penn
- At yearly follow ups, recovery was highly variable
  - frustration with US Government
  - many felt that the USG was skeptical of their ongoing symptoms
  - strong insistence on it being a directed source

(per Randy Swanson, personal communication)



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## CASE STUDY: Evaluation for Mr. B

- Clinical History
- Vital signs/Physical Exam:
  - Differential diagnosis must exclude urgent medical conditions:
    - Cerebral Vascular Accident/Stroke
    - Transient Ischemic Attack (TIA)
    - migraine (including vestibular and ocular)
    - infectious etiology
- Cognition: Standardized Assessment of Concussion (SAC)
  - documenting the presence and severity of neurocognitive impairment
  - validity of SAC
  - orientation, memory, and concentration
- Labs/Imaging
- Consults
- Buckets for findings



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So, what now for Mr. B and his evaluation? As always, start with a good clinical history, Vital Signs and a Physical to rule out anything urgent like stroke or TIA, as well as emerging conditions like migraine or an infectious process. I want to point out that the Standardized Assessment of Concussion (or SACK) would only be used in the acute less than 7-day period since it has no specific diagnostic value after this time. As the name implies, it's a standardized way to objectively document the presence and severity of cognitive impairment associated with concussion, so what you are looking for in AHI are deficits in orientation, memory, and concentration. Since there are no Clinical Practice Guidelines for AHI, the best we can use are procedures already in place for similar types of injury. Those familiar with the SACK know there are 3 versions, so if it were up to me, I would choose the middle of the 3 for a baseline rather than start with the easier or harder version. The point is to establish a baseline since most don't have a baseline test, however, some Veterans and DoD personnel will have an ANAM or Automated Neuropsychological Assessment Metrics on file. In terms of Labs and Imaging, since there is no standard of care, you should order these tests based on your clinical history and the same with Consults. Most consults for AHI are centered around PM&R, neurology, ENT, and Infectious Disease. And consult as you would with any difficult case...and most, if not all, AHI cases are difficult. But you would order general labs for many rule outs and specific tests based on history...for example, if there was tick exposure, you'd order a Lyme titer. In some cases...an MRI can be therapeutic and re-assuring. Lastly, we like the term "Buckets" for findings. There appear to be 3 types with or without overlap: the first is for brain injury similar to concussion with HA, mood dysregulation, sleep disturbance, and cognitive issues. AHI looks very similar to concussion or multiple Mild TBI. Like PPCS, it can be treated with botox, CBT, Lightbox therapy, sleep hygiene or medication, as well as off-label stimulants for cognition.

The second bucket is related to peripheral/vestibular injury, Benign paroxysmal positional vertigo

easier to say BPPV, vestibular neuritis, vestibular migraine, or an otolith issue.  
And the third bucket is related to a Major stress response in that these patients know something strange or odd occurred, and some are terrified at the time and may have symptoms related to PTSD and emotional dys-regulation. Some are overwhelmed by the sympathetic nervous system so treatments that help PTSD may be effective such as CBT with medication or SGB.

## AHI ACUTE Assessment Overview

- Prompt medical evaluation and care is paramount
- No evidence-based AHI-specific clinical tool exists
- AHI Acute Assessment (DHA Form 244)
  - AHI is akin to traumatic brain injury (TBI)
  - many sections are adopted/modified from TBI evaluations
- DHA Form 244 should be administered **within 7 days**
- Evaluation must include explanatory diagnoses
  - such as but not limited to:
    - stroke, migraine, infection, head trauma, vestibular neuritis, acute anxiety disorder, labyrinthitis, etc.
- Symptoms may include:
  - dizziness, distress, HA, hearing loss, insomnia, N, confusion and slowed thinking



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Note that Acute is underlined in the title related to the first bullet. Many individuals who have been treated immediately after an—AHI event have improved, so prompt medical evaluation and care is vital. Since there are no evidence-based, specific clinical tools to determine presenting symptoms from other medical conditions, it is best to utilize the AHI Acute Assessment (DHA Form 244) on all who meet criteria of BOTH a sensory event AND related onset of symptoms. As I noted, AHI is akin to TBI, therefore, many sections of Form 244 are adopted and modified from TBI-specific evaluations. Again, given the importance of time, the evaluation should be within 7 days. As already noted, rule out any “Red Flags” for symptoms in the 5th Bullet. And in the last bullet you can see that symptoms differ, thus making these very difficult cases to evaluate.

# AHI Acute Assessment: DHA FORM 244

- Patient completes sections:
  - A. Demographics
  - B. Information About AHI Exposure
    - Describes exposure
    - DO NOT include operationally sensitive information
    - Healthcare record is unclassified
  - C. Symptom Screening
  - D. Activities-Specific Balance Confidence
- Healthcare Professional completes:
  - E. Medical and Surgical History
  - F. Physical Examination
  - G. Oculomotor Assessment
  - H. Cognitive Exam – Delayed Recall
  - I. Vestibular Assessment
  - J. Results
  - K. Disposition

**SECTION A: DEMOGRAPHICS** (Completed By The Patient) Note: This form is for use with U.S. uniformed services personnel and U.S. government civilians 18 years and older.

1. FULL NAME: \_\_\_\_\_ 2. TODAY'S DATE: (YYYYMMDD) \_\_\_\_\_ 3. DATE OF BIRTH: (YYYYMMDD) \_\_\_\_\_

4. DOMINANT HAND:  Right  Left  Prefer not to answer

5. GENDER: \_\_\_\_\_

6. Which of the following would you say best describes:

a. Ethnicity  Hispanic or Latino  American Indian or Alaska Native  Native Hawaiian or other Pacific Islander  
 Not Hispanic or Latino  Asian  White  Other: \_\_\_\_\_

b. Race (Please check all that apply)  Black or African American  Prefer not to answer

7. LEVEL OF EDUCATION:  High School  Some College  Undergraduate  Advanced Degree

8. DEPARTMENT AFFILIATION:  Active Duty Military  Government Civilian

9. DEPARTMENT: \_\_\_\_\_

**SECTION B: INFORMATION ABOUT AHI EXPOSURE** (To be Completed By The Patient)

10. Are you reporting possible exposure(s) to an unusual sound, heat or sudden intense head pressure, and upon moving away from the area where you heard the sound or experienced the sudden pressure or heat, do the symptoms immediately/rapidly resolve completely?  
 YES  NO

11. Do you report the incident to your supervisor's counterintelligence personnel, such as here: Criminal Investigative Service (CIS), Army Counter Intelligence (ACI), Air Force Office of Special Investigations (AFOSI) or DoD Agency or component counterintelligence team?  
 YES  NO

12. Description of Exposure:  
 Do not put operationally sensitive information in your description.

\_\_\_\_\_  
 \_\_\_\_\_

**SECTION C: SYMPTOM SCREENING** (Completed By The Patient)

Using the 0-6 scale below, indicate the severity of symptoms you experienced at the time of the exposure described in Section B.

Symptom Screening:	0	1	2	3	4	5	6
Severity Rating:	None	Mild		Moderate		Severe	
13. Headache or Head Pressure:	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
14. Fatigue; Foggy and Slowed Speech:	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
15. Trouble Concentrating:	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
16. Trouble Remembering Things:	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
17. Word Finding Challenges:	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
18. Slowed Speech:	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

DHA FORM 244, AUG 2022 CUI (When Filled in) Page 2 of 15 AEM Designer 6.6

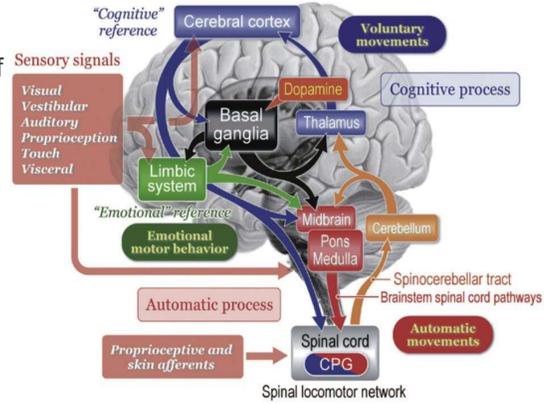
I won't spend much time on the next 2 slides but just wanted to familiarize those who haven't seen Form 244. This form allows you to document general information about an AHI incident such as location, time of day, month, activity, etc., however, you should direct patients to a security team for clarification of exposure details if there is uncertainty.

In other words, exclude clinically unrelated details such as speculating on specific devices, country, energy sources, etcetera. Leave that to the intelligence experts to follow-up on.

Section G: Oculomotor Assessment  
 Vestibular Ocular Motor Screening (VOMS) Introduction

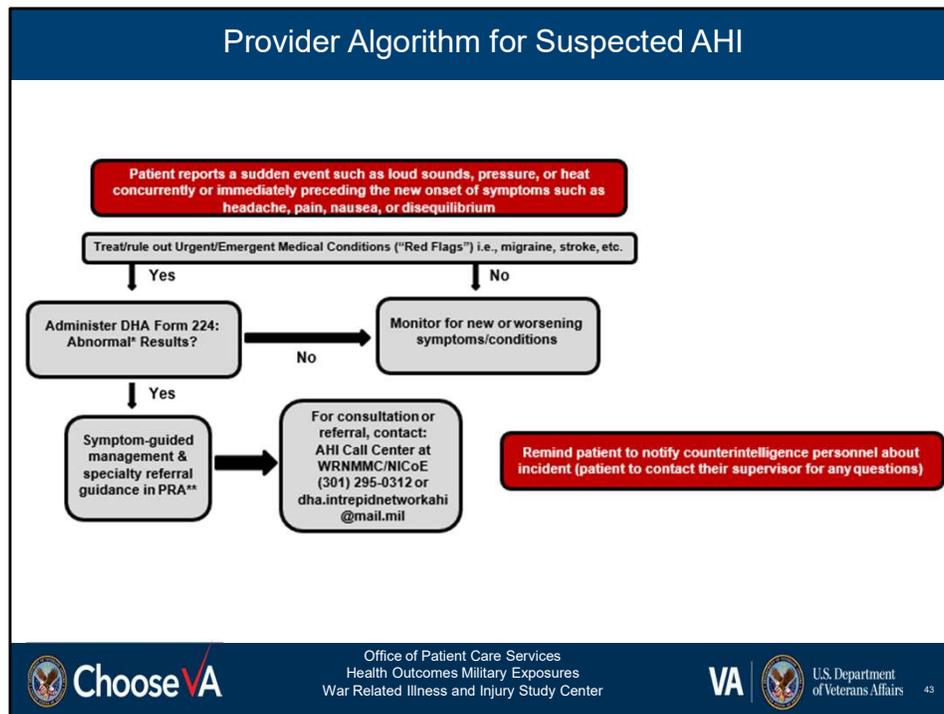
**VOM System**

- A complex network that connects sensory organs of the inner ear to the brain stem, cerebellum, cerebral cortex, ocular system and postural muscles
- Comprised of Vestibulospinal and Vestibulo-ocular tracts
- Together, they are responsible for integrating balance, gaze stabilization, and visual and spatial orientation



Menon, Clinical Overview: Abnormal Balance or Gait, Elsevier, 2022

This is an example of just one of the sections on the 244, section G for Oculo-motor Screening. I've included information about the V-O-M system on this slide. The point of this slide is to show how 244 clearly outlines each part of an AHI evaluation. The form can be found on the DHA intranet, so a Common Access Card is needed to access it and the training. For Section G, the training reviews and demonstrates the Vestibular/Ocular-Motor Screening for Concussion. So the takeaway is that in the absence of blunt trauma or blast exposure, it may be an indicator of AHI or Havana Syndrome. Our understanding of the causes and prognosis of AHI is evolving, so there is a clear need for a systematic approach for reported cases, thus, the reason DHA developed the 244. And with many new illnesses or exposures, guidance may change over time after continued review and analysis of the clinical data.



I included this Algorithm to reference. I want to highlight the box at the lower left for symptom-guided management and referral if needed for PRA or Progressive Return to Activity and next to it a NICoE POC. Lastly, it is important to tell the patient based on the history of the event, that he or she should report the incident to intel personnel HOWEVER, ONLY if it was a suspected targeted attack and that no other explanation of friendly devices were being used in the area by the U.S. If unknown, as a provider, just inform them that they should report anything suspicious to their intel point of contact.

## What **NOW** for Case Study?

- Inform Veteran Mr. B that he was not exposed to an AHI
  - document his exposure concern
  - determine if further evaluation is needed
  - many treatment options to improve his QoL
    - OTC sleep medication?
- Focus on “The Big 4” that ALL Vets need!
  - sleep
  - diet
  - exercise
  - socialization
- Consultation to other services
  - as needed
  - diminishing returns



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So, what NOW for Mr. B? Let him know that he was NOT exposed to an AHI however he likely WAS exposed to a communication high-power microwave device and record this in his EHR. Determine if there is further work-up that should be completed. Given his cognitive concerns, it may be useful for baseline Neurocognitive testing in case his symptoms worsen over time. As with all patients, be open and up front, inform him that there is little published on the effects of this exposure as well as other types of energy exposures in humans. Let him know there are many treatment options for his symptoms to improve his quality of life. For example, recall he was using Over The Counter Unisom which could cause ACB or Anticholinergic Burden which could be causing or exacerbating his cognitive impairment. And with all Veterans, highlight the Big 4, many of which lack the last one listed after getting out of the military where there is a loss of close friends and that military cohesiveness. And lastly, consultation as needed for new symptoms. As Elliot Fischer noted and I discussed in last month's webinar, more medical care is not necessarily better medical care, largely in part due to what he called the law of diminishing returns. In short, with more care provided, the more likely patients could experience more iatrogenic harm than benefit. And, if you look hard enough, you find things but you don't know causation thus clouding the clinical picture.

## War-Related Illness and Injury Study Center (WRIISC)

- **3 Sites:**
  - Washington DC
  - East Orange NJ
  - Palo Alto, CA
- **3 Missions**
  - Clinical Consultation
  - Research
  - Education
- **Specialty subcenters**
  - CA – Women's Operational & Military Exposure Network (WOMEN)
  - **DC – Complex Exposure Threats Center (CETC)**
  - NJ - Airborne Hazards & Burn Pits Center of Excellence (AHBPCE)
- **VA's National Post-Deployment Health Resource**



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Information about the 3 WRIISC's, their locations as noted on the map and the states and US territories each WRIISC covers. The primary mission for all 3 is CLINICAL, then research and then education. We do our best to assist you to help the Veterans you care for AND there are NO barriers to consulting us. We'll contact you within 5 business days after you place a consult. So, when should you reach out to the WRIISC and how? When you've exhausted your evaluation and treatment efforts that I discussed earlier, place a consult in CPRS (the VA EHR), we will evaluate ALL SUSPECTED cases of AHI in our CETC.

## CETC: a new DC-WRIISC Program

A sub-center of the Washington DC War Related Illness and Injury Study Center (WRIISC), under the VA Health Outcomes Military Exposures (HOME):

- **Mission:** Expert care and cutting-edge research of unique and emerging *complex exposure cohorts*.
- **Vision:** To enhance the health and lives of Veterans through innovative clinical services and cutting-edge research, focused on individuals and cohorts with uniquely hazardous occupations or novel/complex exposure histories.



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### The Need:

Novel technologies and dynamic occupational and environmental conditions present new, poorly understood, and complex military exposures with unknown health impacts.

### Our Approach:

Leverage strong connections between VA, Federal agencies, academic institutions and stakeholders to ensure VA leads a proactive response to emerging exposure threats to current and future Veterans.

## CETC Support of other VHA Programs

- Veterans Health Administration (VHA) **Center of Excellence (COE) designation: under review**
- Unique capabilities: highly **specialized clinical provider expertise** and **innovative research protocols**.
- Ensure effective coordination, collaboration, synchronization, and integration of efforts



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– Effective coordination, collaboration, synchronization, and integration of efforts: both within the VA and with stakeholders outside the VA.

VHA Programs with common (and possibly overlapping) exposure-informed care interests: Epidemiology, SMEE, ESP, EXPRT

External to VA stakeholders: DoD (USU, DHA, etc.) Academic Institutions (UMD, UPENN, Rochester Regional Health Center)

## 5 CETC Lines of Effort

1. **Health Threat Detection:** Looking “over the horizon” for novel and emerging military exposure threats
2. **Exposure Cohort Management:** Exposure Cohorts of Interest and notable military exposure groups
3. **Specialized Clinical Evaluation:** Unique, multidisciplinary clinical process
4. **Innovative Research:** three cores (Exposure Science, Clinical Research, and Computer Modeling/Data Integration)
5. **Education Services:** Exposure outreach to stakeholders and specialized training



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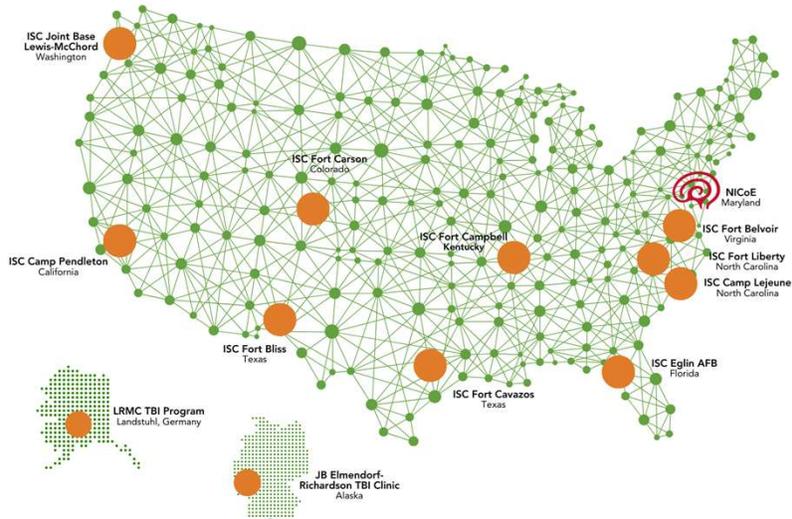
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# Defense Intrepid Network for TBI and Brain Health



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## Provider Resources

- NDAA Fiscal Year 2022 Sec. 732,
  - “Access by United States Government Employees and their family members to certain facilities of Department of Defense for Assessment and Treatment of Anomalous Health Conditions.”
- Patients not responding to initial medical management should be referred to closest TBI clinic, Intrepid Spirit Center, or the National Intrepid Center of Excellence (NICOE).
  - AHI Call Center at Walter Reed National Military Medical Center
    - For consultation, more in-depth evaluation, referral assistance, etc.
    - Phone number: 301-295-0312
      - Only to be used by medical providers
      - Staffed Monday-Friday from 8 a.m.-4 p.m. ET
    - Email address: [dha.intrepidnetworkahi@mail.mil](mailto:dha.intrepidnetworkahi@mail.mil)



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## AHI Future Research Directions

- Filling research gaps and exploring alternative explanations
- Ongoing investigations into exposure sources (e.g., pulsed electromagnetic radiation )
- Identifying clinical solutions
- Collaboration with experts in the field
- Conclusions & Consensus:
  - Consensus on chronic negative health outcomes
  - Acknowledgment of the complexity of AHIs and the many Unknowns
  - Emphasis on the importance of ongoing research
  - Call for continued support and care for affected individuals



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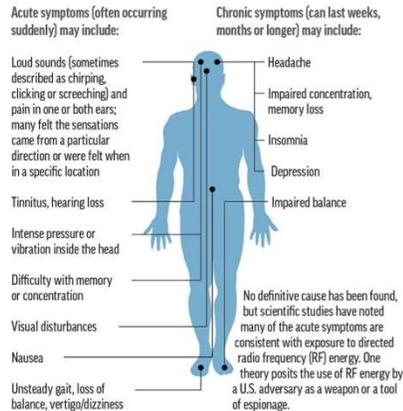


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## Summary and Conclusions

### What is Havana syndrome?

The medical mystery named for the Cuban city where U.S. diplomats first experienced sudden, debilitating symptoms in 2016 has been reported by Americans serving in several other countries.



Source: National Academy of Sciences

AP

- No Consensus
- Most with normal neuro exam
- Reviewed the clinical presentation , evaluation and treatment
- AHI Acute Assessment Form (DHA Form 244)
- DHA recommended treatment and referral strategies
- Progressive Return to Activity
  - [https://jts.health.mil/assets/docs/cpgs/Progressive\\_Return\\_to\\_Activity\\_Following\\_Acute\\_Concussion\\_mTBI\\_Clinical\\_Recommendation\\_2021.pdf](https://jts.health.mil/assets/docs/cpgs/Progressive_Return_to_Activity_Following_Acute_Concussion_mTBI_Clinical_Recommendation_2021.pdf)



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In summary, for future reference, the picture on the right from the NASEM is a nice roll-up of AHI. On the left, there is no consensus on what has caused these AHI and specifically Havana Syndrome events. Many had normal neuro exams...EVEN those who presented acutely. We discussed the presentation evaluation and treatment. The DHA 244 is a clinical screening tool and can provide a comprehensive overview of potential impairments from AHI and is best utilized within 7 days of exposure. Providers should initiate appropriate interventions and referrals for identified deficits, and lastly, use the PRA Progressive Return to Activity, Stages 1-5, which can be accessed with the link on this slide for more guidance.

Stages 1–5 Stage 1\*: Relative Rest Avoid symptom provocation, and rest to promote recovery

- Minimize light and noise
- Stay home/in quarters
- Daily activities that do not provoke symptoms
- Limit large or sudden changes in head position
- No exercise
- Limit screen time as needed to avoid symptom provocation
- Very light leisure activity (e.g. reading, television, conversation)
- Do not go outside the wire in a combat zone
- Maintain or reduce pre-injury levels of caffeine/energy drinks and nicotine
- No alcohol\*\*
- No combatives or contact sports\*\*\*
- No driving until visual and vestibular symptoms have resolved
- No weapons fire or blast exposure\*\*\*
- Stage 2: Symptom-Limited Activity Introduce and promote mild exertion
- Calm and familiar environment with limited distractions
- Limit large or sudden changes in head position
- Light routine exertion (e.g. walking on even terrain, light household chores, stationary bike)
- No weight or resistance training
- Simple, familiar activities performed one at a time (e.g. routine computer use, leisure reading)
- Stage 3: Light Activity Introduce occupation specific exertion and environmental distractions
- Introduce environmental distractions during activity
- Return to work on limited duty/profile without significant symptom provocation
- Initiate tasks requiring changes in head position
- Light aerobic exercise without resistance (e.g. elliptical, stationary bike, walking on uneven terrain)
- No lifting > 20 pounds
- No resistance training
- Simple, unfamiliar tasks or complex familiar tasks (e.g. grocery shopping, technical reading)
- Stage 4: Moderate Activity Increase activity intensity and duration
- Distracting or busy environment during activity as tolerated
- Attempt tasks requiring more significant or sudden changes in head position
- Increase intensity and duration of activities

(e.g. non-contact sports, hiking or running, push-ups, sit-ups) ● Introduce resistance training as tolerated ● Increase intensity and duration of activities (e.g. navigate busy environments, recall and follow complex instructions) Stage 5\*\*\*: Intensive Activity Introduce exertion of duration and intensity that parallels service member's typical role ● Complete RTD Screening prior to advancement to Stage 6 ● Typical daily environment EXCEPT listed restrictions ● Resume pre-injury exercise routine and training activities Complex problem solving or multitasking with exertion or distracting environment ● Stage 6: Return to Full Duty Return to pre-injury activities ● Typical daily environment ● Unrestricted activity \* Ensure service member adheres to Relative Rest guidelines and attempts to increase activity within 72 hours to avoid potentially detrimental effects of prolonged rest. \*\* Alcohol use can exacerbate post- concussive symptoms of headache, depression, and anxiety and can cause impaired cognitive functioning, dehydration, and sleep disturbances. \*\*\* In Stage 5 the service member may gradually increase exposure to high-risk activities in a supervised training environment based on mission requirements.

Thank you for attending! QUESTIONS?



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Our references follow this slide as well as suggested reading. Although the slides are available today for download, they don't include our notes pages, however the WRIISC Webinar website will include the slides with the notes pages if you want to get more detailed information from today's talk. And those of you that did download the slides today, you can see there are also back-ups slides with additional information. Thank you for participating.

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## Additional Suggested Reading

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## Back-up slides

- AHI registry
  - Joint Trauma System (JTS)
- Policy-level Interventions
- Additional clinical information
- Electromagnetic Field (EMF)
- State Dept Evaluation Information



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## AHI REGISTRY

- Joint Trauma System:
  - Providers are uploading the DHA Form 244 into MHS Genesis/Essentris
  - Accessible for data collection to input the patient into the AHI Registry
  - For the patient to be enrolled in the AHI Registry, there must be an Agency Memorandum of Agreement (MOA) signed by the Agency that the Veteran was working for during the date of injury and a DHA 245 Consent form signed by the patient



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## DHA FROM 244 and 245 CONSENT

- For potential AHI exposure cases:
  - If the individual was a former Active-Duty Service Member (ADSM) whose exposure occurred while they were on Active-Duty, no consent is required just 244
    - majority of the personnel at VA will fall under that category
    - former ADSMs and exposed post-service while working as a contractor or for another government agency
      - THEN there is a blanket consent 245 from the Undersecretary of Defense for Personnel and Readiness
- Bottom line: for an individual who was on active duty who experienced an AHI while on active duty, CETC still requires 245 and Veteran's permission to join the registry
  - DoD/DoJ (DEA/FBI); MOA's with NSA, DIA, USAID, DHS, DoS (Dept of Commerce, ODNI)



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## AHI PATIENT REGISTRY

- The Department of Defense Trauma Registry (DoDTR) is a web-based data collection tool that captures and documents, in electronic format, information about the demographics, injury-producing incident, diagnosis and treatment, and outcome of injuries sustained by US/Non-US military and US/Non-US civilian personnel in wartime and peacetime from the point of injury (POI) to final disposition. The DoDTR supports US military performance improvement initiatives with global collection and aggregation of casualty care epidemiology, treatments, and outcomes (JTS, n.d.; OSD, 2022).



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## PURPOSE of AHI REGISTRY

- To collect patient medical data related to reported health incidents for the purpose of analysis so that knowledge and characteristics of these incidents can be expanded for further advancements in the diagnosis, treatment, and outcomes of AHI-affected individuals (OSD, 2022).
- Will participation in the registry affect my medical care?
  - Your decision to participate or to decline participation in the registry will have no impact on your medical care.
- If I consent or decline to be in the registry, can I change my mind later?
  - Yes, you have the right to consent, or withdraw consent, at any time.
- Will my Agency or Department know I consented into the registry?
  - We will not publish the names of individuals who choose to participate, nor will your participation be indicated to your home agency, unless your agency specifies that it is a requirement.



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## WHAT INFORMATION WILL BE IN AHI REGISTRY?

- The data collected in the AHI Registry includes your name as it appears in your electronic medical record, your demographic information, the precipitating event (the narrative of what happened when you first experienced symptoms), a description of the symptoms, and any diagnosis or treatment, as well as outcomes of the AHI patient (OSD, 2022).
- Where will my information be stored?
  - Your information/data will be stored on a secure server; privileged access to the AHI registry is restricted to Joint Trauma System (JTS) personnel. The registry is housed within a DoD approved military system, which only grants access to those personnel who support the AHI registry within the Joint Trauma System.
- How long will my information be stored?
  - Information will be stored indefinitely while the registry is maintained.



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## HOW WILL YOUR INFORMATION BE PROTECTED?

- Your information will be protected in the registry by a secured firewall with access requirements including restriction to a DoD network, registry account approved computer access card (CAC) certificates, and autonomous role-based password controls.
- How can I ensure that my information is correct?
  - Patients can check the accuracy of their information through the electronic health record patient portal.
- Who will see my information in the registry?
  - Your data/records are confidential to the extent permitted by law and only personnel on a need-to-know basis will have access to your personal identifying information (PII). Unless a requesting Agency/organization has approval through the DHA Privacy and Civil Liberties Office, we will not share your data. If approved, a requestor would not see your PII or data elements that could point to or identify you; these data elements would be redacted, and your identifiers will be removed in all reports. All reasonable efforts will be made to keep the personal information private and confidential, but absolute confidentiality cannot be guaranteed. Data collected are used solely for analysis (OSD, 2022).



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## CAN MY INFORMATION BE SHARED?

- PII and personal health information (PHI) can only be shared with researchers that receive an approved Data Sharing Agreement (DSA) from DHA's Privacy and Civil Liberties office. A DSA is an administrative control used by DHA to document that the requested use of data is in compliance with all federal laws and DOD policies.
- The DSA documents the responsibilities of the requestors, including the government sponsor and applicant/recipient. The DSA also confirms that DHA data will be used as permitted or required, and it exercises administrative, technical, and physical safeguards to protect the privacy of PHI, as required by the Health Insurance Portability and Accountability Act (HIPAA). The DSA determines the HIPAA-defined category of data intended for use (i.e., protected health information, a limited data set, or de-identified PHI). HIPAA permits a covered entity to use or disclose a limited data set for research, public health, or health care operations purposes. The DSA also maintains records to confirm compliance in case of an investigation.



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## OTHER REGISTRY QUESTIONS

- Is this a one-time data pull or will my information be continuously uploaded into the registry?
  - Your information will be drawn from medical records and entered into the JTS DoD AHI registry. JTS personnel will collect information up to one year after your initial evaluation. Additional information beyond one year may be gathered by request.
- Is my information de-identified or will it be attributable to me?
  - Research data may be released with an approved DSA from the DHA's Privacy and Civil Liberties office. However, your identifiers will be removed from reporting prior to sharing. De-identified data can also be released to other federal agencies through an approved Institutional Review Board (IRB) research protocol (OSD, 2022).
- How are individuals included in the registry?
  - Any participating Department of Agency, to include the Department of Defense, has a Memorandum of Agreement (MOA) with the Defense Health Agency (DHA). That MOA requests permission from the referring Agency to allow their employee to be included in the patient registry. The DHA will also request permission from the individual to include them in the patient registry as well.



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## REGISTRY REFERENCES

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## Policy-level Interventions

- President Biden signed into law the HAVANA Act (Helping American Victims Afflicted by Neurological Attacks) Act on October 8, 2021, providing benefits and compensation to individuals affected.
- In 2021 The Joint Intelligence Community Council unanimously agreed to support National Security Council (NSC)-led interagency efforts to address AHI to identify the cause of AHI, provide the highest level of care to those affected, and support those affected by AHI to ensure they are believed, heard, and respected
- Regarding legislation. The National Defense Authorization Act (NDAA) 2022 requires the DoD to provide medical assessment and individual treatment of employees and their family members affected by AHIs.
- The Intelligence Authorization Act (IA) 2022 requires NSC to develop standardized protocols including: post-AHI medical testing of employees, and the dependents



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## DHA From 244 Key Takeaways

- The AHI Acute Assessment (DHA Form 244) is a clinical screening tool that includes:
  - a comprehensive clinical exam
  - Interview
  - medical history with an assessment of:
    - neurocognition
    - Symptoms
    - Balance
    - vestibular and oculomotor systems
- This multimodal tool can provide a comprehensive overview of potential impairments from AHI and is best utilized within 7 days of exposure
- Using the Progressive Return to Activity (PRA) for guidance, providers should initiate appropriate interventions and referrals for identified deficits



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## Standardized Measures Used in Clinical Assessments

### **Cognitive**

- Boston Diagnostic Aphasia Examination
- California Verbal Learning Test–2nd Edition
- Grooved Pegboard
- Test of Memory Malingering
- Trail Making Test, Parts A and B
- Wechsler Adult Intelligence Scale–IV
- Wechsler Memory Scale–IV

### **Mood**

- Beck Depression Inventory (2nd edition)
- Beck Anxiety Inventory
- Frontal Systems Behavior Scale
- Post-Traumatic Stress Disorder Checklist
- Vestibular/Ocular Motor Screening

### **Balance and vestibular**

- Functional Gait Assessment
- Activities-Specific Balance Confidence
- Balance Error Scoring System
- Clinical Test of Sensory Organization and Balance
- Dizziness Handicap Index
- Computerized Dynamic Posturography
- Caloric reflex test

### **Vision and oculomotor**

- Formal Evaluation of Vergence and Accommodation
- Convergence Insufficiency Symptoms Survey
- Developmental Eye Movement Test

➤ *Measures were used based on clinical indications; therefore, every patient did not complete all measures in this list.*



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## ELECTROMAGNETIC FIELDS (EMF)

- Electromagnetic field (EMF)
  - energy field from a source containing both electric and magnetic field components
- Recurrent exposures
  - exposures where continued operation at elevated EMF levels is required for safety, force protection, and mission success
    - such mission-critical exposures may include radars, communications systems, IED jammers where a reduction in output may be a greater risk factor
- Dosimetric reference level (DRL)
  - limits relative to dosimetric thresholds for established Adverse Health Events that incorporate appropriate safety factors
    - DRLs are expressed in terms of in situ electric field strength (0 Hz to 5 megahertz), specific absorption rate (100 kilohertz to 3 GHz), or incident power density (3 GHz to 300 GHz) with the associated averaging times. DRLs are equivalent to the quantity referred to as “basic restrictions” in earlier standards
- Exposure reference level (ERL)
  - the highest level of an electric field, magnetic field, EMF, induced current, contact current, induced voltage, or contact voltage to which the standard permits exposure and which provides an adequate margin of safety against established AHEs
    - ERL may be exceeded if it can be shown that the corresponding DRL is not exceeded

DODI 6055.11 "PROTECTING PERSONNEL FROM ELECTROMAGNETIC FIELDS" May 12, 2021



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Remote and stationary jammers: Counter **radio-controlled improvised explosive device** (RCIED) electronic warfare (CREW)

Crew systems were vehicle mounted and man portable depending on the system you had. Man-portable CREW systems were worn like backpacks with the whip antenna behind the carrier's head. Vehicle mounted systems were inside the vehicle and connected to an even longer whip antenna on the exterior of the vehicle. EMR would be in the same range. The strength of the signal was the “bubble” of protection you had for any given device.

## EMF KEY POINTS

- 25k studies over the last 30 years
- There is no doubt that short-term exposure to very high levels of electromagnetic fields can be harmful to health
  - Hypersensitivity to electric or magnetic fields
    - aches and pains, headaches, depression, lethargy, sleeping disorders, convulsions and epileptic seizures
- The main effect of radiofrequency electromagnetic fields is heating of body tissues
  - Cancer
    - despite many studies, the evidence remains highly controversial
      - if electromagnetic fields do cause cancer the risk is be extremely small
      - studies to date contain many inconsistencies, but no large increases in risk have been found for any cancer in children or adults

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## State Department Evaluations

- “An Analysis of Data and Hypotheses Related to the Embassy Incidents”
  - Data from NIH cohort primarily
  - Few controls
  - Not a hypothesis driven investigation
  - Selection biases
- Implausible mechanism of injury
- Functional disorders explain “at least a subset of the long-term symptoms”
- Conclusions:
  - No consensus
  - Convergence insufficiency
  - Hearing loss
  - Brain white matter changes
  - NF-L (Neurofilament Light chain)
  - Persistent Postural Perceptual Dizziness, Vestibular Migraine
  - Normal neurologic exams



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Convergence insufficiency impacts the eyes when looking at near objects and can show up as blurred or double vision. In today’s world, this impedes patients with reading or using a tablet or smartphone, very important for work as well as leisure. Headache.

Double vision.

Eye fatigue.

Blurred vision.

Sleepiness when reading.

Needing to re-read things.

Trouble concentrating on what you are reading.

Often losing your place when reading.

2 chronic issues were vestibular and cognitive, feasible but limitations to get a cross-sectional NP battery for vestibular and cognitive. NF-L or Neurofilament Light chain, can be measured in blood, also GFAP (Glial fibrillary acidic protein) and possibly other neuronal proteins. Implementing at DC VA for MS but not available currently, but there is a panel. Has some promise for measuring brain injury, not clinically diagnostic now, but may be useful in the future. NF-L in Vienna case very high, flown back, but not many symptoms in that case/patient. State can’t see medical records

from NIH so patients were not minimizing.

There may be possible blood tests for cognition/brain injury markers that could be useful or promising, but both of these are not widely available:

Neurofilament light chain (NF-L or NFLC or NfL)

GFAP (Glial fibrillary acidic protein)