AIRBORNE HAZARDS

WHAT DO PROVIDERS NEED TO KNOW?

Many Veterans are concerned about exposure to airborne hazards after deployment to Iraq and Afghanistan. Airborne hazards include particulate matter that may come from a variety of sources (see sidebar). Particulate matter can consist of combustion particles, organic chemicals, metals, and soil and dust particles, some of which are known to have adverse health effects. Many Veterans have heard about the studies done on airborne hazard concerns so it is important that providers know what these studies say about the potential for short or longer term health effects. This fact sheet summarizes those studies and discusses how a provider can best address a Veterans health concerns.

WHAT IS KNOWN ABOUT AIRBORNE HAZARDS EXPOSURES?

Particulate matter levels in Iraq and Afghanistan are very high, often exceeding military and occupational guidelines,[1] but an association between respiratory symptoms and/or disease remains to be established.[2] It is now, however, increasingly recognized that deployment to Iraq or Afghanistan may be a risk factor for airway disease. In support, high rates of respiratory illness (up to 70%) have been reported during deployment,[3] and increased respiratory system medical encounters have been reported after deployment.[4] Additionally, military personnel deployed to Iraq or Afghanistan have a greater risk of subsequent respiratory conditions,[5,6] including new-onset asthma,[7] in comparison to non-deployers. Despite a well-observed increase in post-deployment respiratory symptoms, cumulative deployment duration and total number of deployments was not associated with respiratory symptoms in a nested case-control study.[4] In contrast, work from the WRIISC recently reported that longer deployment lengths are associated with greater airflow limitation in deployed Iraq and Afghanistan Veterans.[8] Therefore, our understanding of the relationship between deployment characteristics and respiratory health continues to emerge.

Health effects related to specific airborne hazards exposures, such as smoke from open burn pits, have also been studied with mixed findings. In a large cohort study, investigators did not observe an increased risk for respiratory outcomes among military personnel deployed within 3 or 5 miles of documented burn pits.[9] Conversely, self-reported burn pit exposure was associated with a higher incidence of cardiorespiratory conditions among participants of the Airborne Hazards and Open Burn Pit Registry[10] (see below for details on Registry). Smoke from burn pits was also implicated in a case series of deployed soldiers with constrictive bronchiolitis who were evaluated for decreased exercise performance in the context of minimal objective pulmonary function or radiographic findings.[11]

★ Potential Sources of Potential Airborne Hazards Exposure

- Combustion of human and non-human solid wastes
- Smoke from fires, explosions, and burning oil wells
- Dust and sand particles
- Industrial and ambient air pollution
- Air craft and automobile engine exhaust

Morris and colleagues reported the first prospective standardized evaluation of 50 deployed soldiers with new-onset respiratory symptoms post-deployment.[12] This study illustrated the complexity in evaluating deployed Veterans and Servicemembers, as a large percentage of individuals had normal findings on testing or who remained undiagnosed after a comprehensive workup. Normal testing in the setting of respiratory symptoms has also been described by others, including work from the WRIISC.[8,11] It is important to know that at this point, there is enough evidence to warrant heightened clinical attention to deployed military personnel who report significant cardiorespiratory symptoms, particularly rapidly

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progressing exertional dyspnea, even though they may have normal lung function tests and imaging studies. In fact, a recent review of VA medical encounter data reports an increasing prevalence of asthma, COPD, and interstitial lung disease in Iraq and Afghanistan Veterans.[13]

AIRBORNE HAZARDS & OPEN BURN PIT REGISTRY

Public Law 112-260, entitled the "Dignified Burial and Other Veterans' Benefits Improvement Act of 2012," required the Department of Veterans Affairs (VA) to implement the **Airborne Hazards and Open Burn Pit Registry** (registry)[12]:

1. To be enrolled in the registry, Veterans and Service members must complete an on-line self-assessment health questionnaire. For more information about the questionnaire, visit: https://veteran.mobilehealth.va.gov/AHBurnPitRegistry/#page/home
2. After filling out the self-assessment questionnaire, individuals can request an in-person medical evaluation at the VA at no cost.
   - For Veterans already enrolled in the VA health care system (VHA care), they can request for a medical evaluation with their regular VA primary care team.
   - For Veterans or service members that are not enrolled in VHA care, they can request for a medical evaluation by an Environmental Health Coordinator (EHC) at their local VA health care facility. A list of EHCs at VA health care facilities is available at: http://www.publichealth.va.gov/exposures.

CLINICAL ASSESSMENT TOOL FOR AIRBORNE HAZARDS EXPOSURES

A registry initial clinical assessment template has been developed to provide a standardized framework for VA health care providers to ***document the in-person clinical evaluation component of the registry***.

The clinical template is a tool that helps a provider conduct an appropriately detailed medical evaluation and engage in conversation with Veterans about their symptoms and health concerns related to their deployment-related exposures. Use of the clinical template will also help to facilitate better understanding of the relationship between airborne hazards exposure and Veterans' health concerns.

- The registry clinical template resides in the VA's computerized patient record system (CPRS). It provides a link to each Veteran's registry Self-Assessment information. (The provider has the opportunity to review the Veteran's responses to the completed questionnaire in the CPRS template or through the VA's *Airborne Hazards and Open Burn Pit Provider Portal* described below.)

★ **The VA provides detailed reports describing information collected in the Airborne Hazards and Open Burn Pit Registry. Key findings from information entered into the registry from April 25, 2014 to September 30, 2014 by Veterans and active duty service-members include:**

- Participants completed more than 19,000 surveys in the first 6 months of the registry.
- The average age of registry participants is 39 years.
- Most registry participants said they were near a burn pit at some point.
- In addition to burn pits, registry participants were exposed to other hazards on the job or in the environment, like weapon blasts, pesticides, and dust storms.

Find the full report at: http://www.publichealth.va.gov/exposures/burnpits/registry.asp

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- The template allows the clinician to focus on capturing clinically-relevant information in a systematic, patient-friendly, and efficient manner during the initial in-person clinical assessment.
- Components of the initial evaluation in the template include: **Chief Complaint**, **History of Present Illness, Physical Examination**, **Diagnostic Work-up to date**, and **Assessment and Plan**.

Using the template in CPRS allows a provider to have ready access to relevant diagnostic test results already available in the patient's medical records which will guide the provider on the appropriate next steps in the Veteran's clinical management.

To access a Veteran's registry questionnaire responses through the VA's **Airborne Hazards and Open Burn Pit Provider Portal**, visit https://staff.mobilehealth.va.gov/AHBurnPitRegistry/#page/home. CPRS/VISTA log-in and password can be used to log in and search for a patient using their name and last four digits of their social security number. Responses to the questionnaire can be reviewed in advance to facilitate visit effectiveness and is recommended.

WHAT SPECIALTY CONSULTATIONS ARE WARRANTED?

The decision to have specialty evaluations should be based on each Veteran's symptoms, findings on initial evaluation, the clinical experience and expertise of the primary care team. Some specialty consultations that may be of relevance and available at a Veteran's local VA health care facility include: pulmonary, allergy/immunology, and ear, nose, and throat.

Specialty consultations may result in additional medical assessments, such as full pulmonary function tests with lung volumes and diffusion capacity tests (DLCO), Methacholine challenge test, high-resolution chest CT scan, assessment of vocal cord function, cardiopulmonary exercise tests, and in some selected cases, bronchoscopy or lung biopsy, even in the context of normal lung function tests and radiographic findings.[13,14,15,10,11]

★ What is an Appropriate Initial Diagnostic Evaluation?

Currently, there are no specific biomarkers of exposures or disease associated with military service in Iraq and Afghanistan. Diagnostic evaluations should be individualized and tailored to each Veteran's specific symptoms and health concerns.

For example, for a Veteran who presents with chronic respiratory symptoms, such as wheezing, chronic cough or dyspnea with exertion, a provider may consider obtaining the following:

- Complete blood count (to rule out anemia)
- Chest X-ray with posterior-anterior and lateral views (to rule out significant structural abnormalities)
- Pulse oximetry (to assess for hypoxia)
- Spirometry with and without bronchodilator (to assess pulmonary function and reversibility of bronchoconstriction).

Other symptoms attributed to airborne hazards exposures should be appropriately worked-up according to accepted clinical standards.

AIRBORNE HAZARDS EXPERTISE *AT THE WRIISC*

After a Veteran has exhausted the appropriate specialty consults and the diagnostic capabilities at the local VA facility, a referral for an evaluation at the War Related Illness and Injury Study Center (WRIISC) may be appropriate. The WRIISC provides clinical evaluations for Veterans with the most complex, difficult-to-diagnose or medically unexplained health concerns related to airborne hazards or other deployment-related exposures. (For more information about the WRIISC referral process, please visit: http://www.WarRelatedIllness.va.gov).

Depending on the Veteran's needs and previous findings, the WRIISC clinical evaluations for airborne hazards concerns may include complete pulmonary function tests – including lung diffusion capacity, forced oscillometry, and exhaled nitric oxide levels, as well bronchoprovocation challenge tests. As many symptoms also occur during exercise, WRIISC specialists conduct cardiopulmonary exercise tests (CPET) to determine whether the lungs, heart or muscles limit exercise capacity. CPET enables measurement of ventilation and gas exchange responses and can be further enhanced with oxygen saturation monitoring and arterial blood gas analysis. In some instances, this may also include performance of exercise laryngoscopy for vocal cord dysfunction.

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★ Talking about Airborne Hazards Exposures and Health Concerns

Health risk communication is a paradigm of communication that emphasizes the importance of building trust through active listening and empathy, recognizing the relevance of perceptions of possible harm from exposures, and the uncertainty often inherent in determining the magnitude and extent of exposure, relationship between exposures and possible health effects, specific medical diagnosis, and prognosis.

It is essential that the health care provider listens to and respects Veterans' perspective about their deployment-related exposures and the health concerns. Evaluating the relationship between airborne hazards exposures and specific health outcomes is a complex process. The clinical and scientific data is evolving and there are still many uncertainties about the potential long-term health effects from these exposures.

By taking the time to listen to the Veteran's concerns and engaging in a clinically relevant discussion, a provider can review with the Veteran, the current gaps in clinical knowledge and current differences in scientific opinion, and in so doing create a rapport and gain the Veteran's trust. This will foster a positive therapeutic relationship between the Veteran and provider, enhance the shared decision making process about appropriate next steps in the clinical management of the Veteran's health, and likely improve the Veteran's overall experience and satisfaction with the clinical interaction.[16]

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