



Photo courtesy of the Department of Defense  
Photo by Master Sgt. Michel Sauret



Photo courtesy of the Department of Defense  
Photo by Airman 1st Class Jennifer Zima

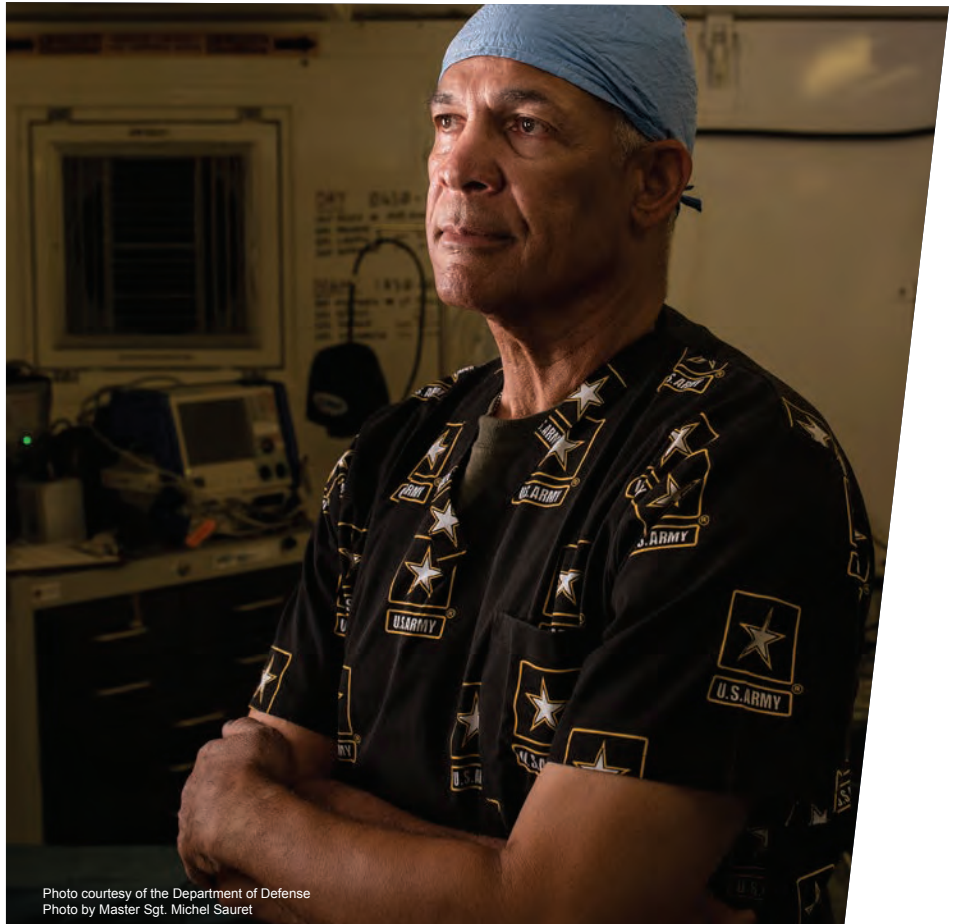


Photo courtesy of the Department of Defense  
Photo by Master Sgt. Michel Sauret

# Airborne Hazards and Open Burn Pit Registry

## DoD Health Care Provider **CLINICAL TOOLBOX**





Photo courtesy of the Department of Defense  
Photo by Master Sgt. Michel Sauret

**Overview and  
Background**

Conducting the  
Medical Evaluation

Clinical  
Considerations

Schematic of DoD  
Medical Follow-Up

Provider  
Resources

Clinical Reports and  
Further Reading

## Be Prepared to Treat Service Members Exposed to Airborne Hazards, Such as Open Burn Pit Smoke

The Department of Veterans Affairs (VA) developed the Airborne Hazards and Open Burn Pit Registry to enable service members and veterans to document their potential exposure to airborne hazards while deployed overseas and to facilitate a discussion with their provider. This toolbox contains background information on airborne hazards and the registry, guidance for conducting the medical evaluation, and resources for you to review and share with service members and other health care providers.

### Overview of Registry

Service members who have been exposed to airborne hazards, such as open burn pit smoke, while serving may be at risk for short- and long-term health issues. After deployment to locations with open burn pits and other pollution sources, service members have returned with a range of mild to serious respiratory illnesses. At this time, there are no biomarkers specific to the environmental exposure-related health concerns of service members who deployed to eligible theaters of operations (listed below).

In June 2014, VA launched the [Airborne Hazards and Open Burn Pit Registry](#) in response to concerns that veterans were experiencing a range of respiratory illnesses possibly associated with exposure to burn pits while serving overseas. The registry allows eligible service members and veterans to document their exposures (such as smoke from burn pits, oil well fires, or pollution) during deployment, as well as health concerns, through an online questionnaire.

The registry is completely voluntary and does not affect access to VA health care or compensation benefits. Upon completion of the questionnaire, registry participants are encouraged to schedule a medical evaluation to review their responses and health concerns with a medical provider.

### Eligibility

Service members who served in the Southwest Asia theater of operations or Egypt on or after August 2, 1990, or in Afghanistan, Djibouti, Syria, or Uzbekistan on or after September 11, 2001, are eligible to sign up. These regions include the following countries, bodies of water, and the airspace above these locations: Afghanistan, Bahrain, Djibouti, Egypt, Gulf of Aden, Gulf of Oman, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates, Uzbekistan, and the waters of the Arabian Sea, Persian Gulf, and the Red Sea.

### Background of Airborne Hazards and Open Burn Pits

The use of open burn pits was a common practice to dispose of solid waste at military sites outside of the U.S. such as in Iraq and Afghanistan. Material burned may have included hazardous waste, medical waste, tires, petroleum products, and plastics, as well as substances known to generate carcinogens and other harmful substances through the combustion process. In addition, elevated levels of particulate matter, including dust from the desert and from industrial activities and other man-made sources, contributed to poor air quality in many locations.

In September 2020, the National Academies of Science, Engineering, and Medicine (NASEM) published a [report](#) evaluating scientific evidence on 27 different respiratory health outcomes. NASEM found there was limited or suggestive evidence of an association between airborne hazard exposure and respiratory symptoms (chronic cough, shortness of breath, and wheezing). The report noted there was inadequate evidence of an association between airborne hazard exposure and the remaining 26 health outcomes. The Department of Defense (DoD) and VA continue to support and fund research studies to determine the short- and long-term health effects of airborne hazards.



Overview and  
Background

**Conducting the  
Medical Evaluation**

Clinical  
Considerations

Schematic of DoD  
Medical Follow-Up

Provider  
Resources

Clinical Reports and  
Further Reading

## Conducting the Medical Evaluation

As required by law, DoD will provide service members with a free, optional medical exam upon request. Active duty service members, including activated Reserve and Guard, are encouraged to contact their local military hospital or clinic to schedule an exam. Army National Guard, Air National Guard, and Reserve members, whether discharged or still serving, can schedule an exam through VA. Veterans and inactive/separated National Guard members and Reservists who indicated an interest in the evaluation will be contacted directly by VA; these registrants may also proactively contact their local VA Environmental Health Coordinator to schedule an exam.

If the service member is receiving the medical exam after signing up for the registry online, they are encouraged to bring a copy of their completed questionnaire. Providers can also access a copy of their patient's completed questionnaire through the Individual Longitudinal Exposure Record (ILER) or Defense Occupational and Environmental Health Readiness System (DOEHRS).

Providers should start by reviewing the service member's questionnaire and discussing their medical history with an emphasis on occupational/environmental exposures. Providers should assess the intensity and specific focus of concern of the individual, bearing in mind that patients seeking medical attention may have a variety of symptoms and exposure concerns.

**The provider should discuss and document the service member's exposures in as much detail as possible.**

**Questions to ask include, but are not limited to:**

- What type of pollution were you exposed to during deployment (for example, off-base pollution such as factories, cars, burning trash, or dust; or on-base pollution such as burning fuel or burn pits)?
- How many hours per day were you exposed?
- How many days, months, or years were you exposed?
- What airborne pollutants have you been exposed to outside of deployment?

Providers should rely on their own evidence-based knowledge, expertise, and skills to guide a patient-centered evaluation and treat their symptoms according to clinical best practices. If clinically indicated, providers may:

- Perform a physical exam, with focus and extent determined by symptoms and/or health concerns
- Order a chest radiograph and spirometry as baseline studies and further diagnostics based on clinical symptoms
- Refer the service member with chronic symptoms to specialists (such as internal medicine, pulmonology, and/or occupational medicine) for further evaluation
- Consider referral for enrollment in ongoing research studies at Brooke Army Medical Center Pulmonary

## Upon completing the exam, providers should document the encounter in the electronic health record; no additional forms are required. Providers should record the following diagnostic codes:

- In the Armed Forces Health Longitudinal Technology Application (AHLTA), use both of the following International Classification of Disease (ICD)-10 codes: Z91.82 (personal history of military deployment) and X08.8 (exposure to other specified, smoke, fire)
- In Military Health System (MHS) GENESIS, use both of the following Systemized Nomenclature of Medicine-Clinical Terms (SNOMED-CT) codes: 3042585015 (history of military deployment) and 165638013 (exposure to environmental pollution, occupational)
- Any additional applicable diagnostic or symptom codes







Photo courtesy of the Department of Defense  
Photo by Master Sgt. Michel Sauret

Overview and  
Background

Conducting the  
Medical Evaluation

**Clinical  
Considerations**

Schematic of DoD  
Medical Follow-Up

Provider  
Resources

Clinical Reports and  
Further Reading

## Clinical Considerations

While there is no single approach to evaluating patients with dyspnea and normal spirometry, [Appendix C](#) of the Borden Institute book on [Airborne Hazards Related to Deployment](#) proposes the following evaluation framework. Considerations should be given to establishing the presence or absence of airway hyperactivity and upper airway disorders as well as ruling out parenchymal lung disease.

### Potential Evaluation of Patients with Chronic Symptoms

Proposed Test	Considerations
<b>Spirometry Post-BD</b>	Review spirometry for reduction in forced expiratory volume in one second (FEV1); 12% increase in post-bronchodilator (post-BD) diagnostic of airway hyperactivity (AHR)
<b>Spirometry w/symptoms</b>	Intermittent nature of asthma may require repeat spirometry when patients are symptomatic
<b>Chest Radiograph</b>	Will be normal in most patients; helpful to eliminate pulmonary infiltrates, effusions, or mediastinal disease
<b>Complete Blood Count</b>	Rule out anemia, especially in females
<b>Inspiratory FVL</b>	Review the inspiratory flow volume loop (FVL) on all spirometry exams for truncation or flattening
<b>Exercise Laryngoscopy</b>	Presence of abnormal FVL or history of inspiratory wheezing or noisy breathing; diagnostic for vocal cord dysfunction
<b>Bronchoprovocation Testing</b>	With normal spirometry, important to rule out underlying airway reactivity such as exercise-induced bronchospasm (EIB)
<b>Methacholine</b>	Most common test used for AHR with good negative predictive value; diagnostic for EIB with associated exercise symptoms
<b>Eucapnic Hyperventilation</b>	Equivalent to methacholine for diagnosing AHR, but requires 15% decrease in FEV1
<b>Exercise Spirometry</b>	Poor predictability compared to other methods and may not reproduce symptoms in laboratory setting
<b>Impulse Oscillometry</b>	Newer modality that measures airway resistance and may identify AHR based on reduction in post-BD values
<b>High Resolution CT</b>	May identify subclinical lung disease, airway trapping or bronchiectasis; low diagnostic yield in this population
<b>Cardiopulmonary Exercise Testing</b>	Primarily used to assess patient's ability to exercise and measure VO2 max; given limited reference values and low suspicion for cardiac disease, may not identify specific cause
<b>Allergy Evaluation</b>	Consideration for allergy testing in patient with other atopic symptoms such as atopic dermatitis, allergic rhinitis
<b>Cardiology Evaluation</b>	Very low likelihood of cardiac disease in a younger population; referral should be based on physical exam findings
<b>Electrocardiogram</b>	Numerous nonspecific changes found in younger population and rarely diagnostic
<b>Echocardiogram</b>	Numerous nonspecific changes found in younger population and rarely diagnostic





Photo courtesy of the Department of Defense  
Photo by Master Sgt. Michel Sauret

Overview and  
Background

Conducting the  
Medical Evaluation

Clinical  
Considerations

**Schematic of DoD  
Medical Follow-Up**

Provider  
Resources

Clinical Reports and  
Further Reading

## Schematic of DoD Medical Follow-Up

An active duty service member, including an activated Reserve and Guard member, becomes aware of the registry through their health care provider or via outreach efforts such as direct mail communications, social media content, events/briefings, or [Health.mil/AHBurnPitRegistry](https://health.mil/AHBurnPitRegistry).

The service member accesses the Airborne Hazards and Open Burn Pit Registry at <https://veteran.mobilehealth.va.gov/AHBurnPitRegistry> and successfully completes the online questionnaire.

The service member requests a medical exam at their local military hospital or clinic to specifically address “health concerns related to the Airborne Hazards and Open Burn Pit Registry exposures.”\*

The service member brings a copy of their completed questionnaire to the medical exam.

During the service member’s medical exam, the health care provider:

- Determines the patient’s concern or chief complaint
- Reviews questionnaire responses with the service member, and documents pertinent positives in the medical record
- Takes a medical history with an emphasis on occupational/environmental exposures, especially airborne hazards and smoking history

If clinically indicated, the health care provider may:

- Perform a physical exam, with focus and extent determined by symptoms and/or health concerns
- Order a chest radiograph, spirometry, and/or further diagnostics based on clinical symptoms
- Refer the service member to a pulmonary specialist for further evaluation

Upon completion of the medical exam, the health care provider:

- Fully documents the encounter and any referrals in the service member’s medical record
- Uses the following diagnostic codes and any other applicable diagnostic or symptom codes related to the visit:
  - ❖ In the AHLTA, use both of the following ICD-10 codes:
    - Z91.82 (personal history of military deployment)
    - X08.8 (exposure to other specified, smoke, fire)
  - ❖ In MHS GENESIS, use both of the following SNOMED-CT codes:
    - 3042585015 (history of military deployment)
    - 165638013 (exposure to environmental pollution, occupational)

\*Retirees and inactive National Guard and Reserve Component members (separated or still serving) can schedule an exam through VA.



Photo courtesy of the Department of Defense  
Photo by Master Sgt. Michel Sauret

Overview and  
Background

Conducting the  
Medical Evaluation

Clinical  
Considerations

Schematic of DoD  
Medical Follow-Up

**Provider  
Resources**

Clinical Reports and  
Further Reading

## Provider Resources

This section contains resources DoD providers can review to learn more about the Airborne Hazards and Open Burn Pit Registry and pass along to colleagues or patients. Click links to download materials or to view more information and visit [Health.mil/AHBurnPitRegistry](https://health.mil/AHBurnPitRegistry) for DoD's latest outreach and education materials.

### Materials for Providers:

- [Printable Wallet Card](#) (DoD)
- [Clinician's Guide to Airborne Hazards](#) (VA)
- [Airborne Hazards and Open Burn Pit Registry Overview PowerPoint Presentation](#) (VA/Army Public Health Center [APHC])
- [Airborne Hazards Registry Initial In-Person Evaluation: A Guide for Veterans and Providers](#) (VA)
- [Airborne Hazards Fact Sheet for Providers](#) (VA)
- [Airborne Hazards and Open Burn Pit Registry Fact Sheet](#) (VA)
- [Frequently Asked Questions about Burn Pit Exposures Fact Sheet](#) (APHC)
- [Burn Pit: Airborne Hazards and Open Burn Pit Registry Poster](#) (APHC)
- [Burn Pit: Airborne Hazards and Open Burn Pit Registry Tip Card](#) (APHC)
- [Airborne Hazards and Open Burn Pit Registry Pre-Participation Fact Sheet](#) (VA)
- [Summary of Evidence Statement: Chronic Respiratory Conditions and Military Deployment Fact Sheet](#) (APHC)

### Websites:

- [Airborne Hazards and Open Burn Pit Registry](#) (VA)
- [MHS: Airborne Hazards and Open Burn Pit Registry](#) (MHS)
- [WRIISC: Introduction to Airborne Hazards for Providers](#) (VA)
- [Directory of Environmental Health Coordinators](#) (VA)

### Videos:

- [VA Airborne Hazards and Open Burn Pit Registry for Veterans and Service Members](#) (APHC)
- [Airborne Hazards and Open Burn Pit Registry](#) (VA)
- [The Airborne Hazards and Open Burn Pit Registry - Participation Benefits](#) (VA)

## Training

Log in to Joint Knowledge Online (JKO) at <https://jkodirect.jten.mil> to search for and complete the training course titled [DHA-US035 Airborne Hazards and Open Burn Pit Registry Overview](#). This course is eligible for Continuing Medical Education credit.



Photo courtesy of the Department of Defense  
Photo by Master Sgt. Michel Sauret

Overview and  
Background

Conducting the  
Medical Evaluation

Clinical  
Considerations

Schematic of DoD  
Medical Follow-Up

Provider  
Resources

**Clinical Reports and  
Further Reading**

## Clinical Reports and Further Reading

Download or explore the following resources to learn more about open burn pits, exposures, and airborne hazards, as well as the Airborne Hazards and Open Burn Pit Registry.

### Reports and General Information:

- [Respiratory Health Effects of Airborne Hazards Exposures in the Southwest Asia Theater of Military Operations](#) (NASEM, 2020)
- [Open Burn Pit Report to Congress](#) (DoD, April 2019)
- [Self-Reported Health Information from the Airborne Hazards and Open Burn Pit Registry](#) (VA, December 2018)
- [DoD Needs to Fully Assess the Health Risks of Burn Pits](#) (Government Accountability Office, June 2018)
- [Assessment of VA Airborne Hazards and Open Burn Pit Registry](#) (NASEM, 2017)
- [Airborne Hazards Related to Deployment](#) (Office of Surgeon General, Borden Institute, 2015)
- [DoD Instruction 4715.19, Use of Open-Air Burn Pits in Contingency Operations](#) (DoD, March 2014)
- [Long-Term Health Consequences of Exposure to Burn Pits in Iraq and Afghanistan](#) (Institute of Medicine [now NASEM], 2011)

### Airborne Hazards and Particulate Matter Research:

- [A Case-Crossover Study of Ambient Particulate Matter and Cardiovascular and Respiratory Medical Encounters Among US Military Personnel Deployed to Southwest Asia](#) (APHC, June 2012)
- [Integrated Science Assessment for Particulate Matter](#) (U.S. Environmental Protection Agency, December 2009)
- [The Periodic Occupational and Environmental Monitoring Summary](#) (APHC, September 2009)
- [Particulate Matter \(PM\) Air Pollution Exposures during Military Deployments](#) (APHC)
- [Health Implications of Deployment Exposures: Diesel and JP-8 Engine Exhaust](#) (APHC)
- [Documentation of Deployment Exposures and the Periodic Occupational Environmental Monitoring Summary \(POEMS\) Information for Preventive Medicine Personnel](#) (APHC)

### Reports on Clinical Concerns Related to Airborne Hazard Exposures:

- [Clinical Evaluation of Deployed Military Personnel with Chronic Respiratory Symptoms: Study of Active Duty Military for Pulmonary Disease Related to Environmental Deployment Exposures \(STAMPEDE III\)](#) (Chest, June 2020)
- [Study of Active Duty Military Personnel for Environmental Deployment Exposures: Pre- and Post- Deployment Spirometry \(STAMPEDE II\)](#) (Respiratory Care, May 2019)
- [Histological Diagnoses of Military Personnel Undergoing Lung Biopsy After Deployment to Southwest Asia](#) (Lung, August 2017)
- [The Impact of Combat Deployment on Asthma Diagnosis and Severity](#) (Journal of Asthma, May 2015)
- [Study of Active Duty Military for Pulmonary Disease Related to Environmental Deployment Exposures \(STAMPEDE\)](#) (American Journal of Respiratory and Critical Care Medicine, July 2014)
- [Evaluation of Deployment Related Respiratory Symptoms](#) (Federal Practitioner, March 2014)
- [Burn Pits: Trash and Human Waste Exposures](#) (VA, November 2013)
- [Diagnosis and Management of Chronic Lung Disease in Deployed Military Personnel](#) (Therapeutic Advances in Respiratory Disease, August 2013)
- [Occupational Causes of Constrictive Bronchiolitis](#) (Current Opinion in Allergy and Clinical Immunology, April 2013)
- [Risk Communication in Deployment-Related Exposure Concerns](#) (Journal of Occupational and Environmental Medicine, August 2012)
- [Overview and Recommendations for Medical Screening and Diagnostic Evaluation for Post Deployment Lung Disease in Returning U.S. Warfighters](#) (Journal of Occupational and Environmental Medicine, June 2012)
- [Chronic Respiratory Conditions and Military Deployment](#) (APHC, July 2011)
- [Constrictive Bronchiolitis in Soldiers Returning from Iraq and Afghanistan](#) (New England Journal of Medicine, July 2011)
- [New-onset Asthma Among Soldiers Serving in Iraq and Afghanistan](#) (Allergy & Asthma Proceedings, September 2010)



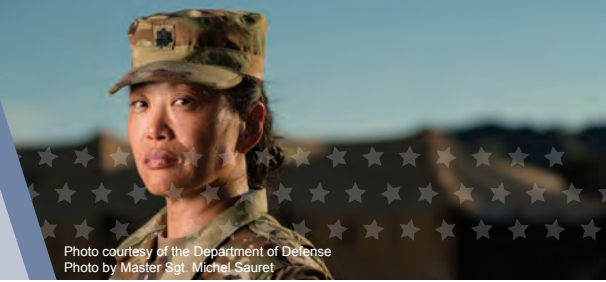


Photo courtesy of the Department of Defense  
Photo by Master Sgt. Michel Sauret

Overview and  
Background

Conducting the  
Medical Evaluation

Clinical  
Considerations

Schematic of DoD  
Medical Follow-Up

Provider  
Resources

**Clinical Reports and  
Further Reading**

- [Acute Eosinophilic Pneumonia \(AEP\) and New Onset Smoking](#) (APHC, January 2010)
- [Newly Reported Respiratory Symptoms and Conditions Among Military Personnel Deployed to Iraq and Afghanistan: A Prospective Population-Based Study](#) (American Journal of Epidemiology, December 2009)
- [Acute Eosinophilic Pneumonia Among US Military Personnel Deployed in or near Iraq](#) (Journal of the American Medical Association, December 2004)

## Location-Specific Assessments and Reports

- [Qarmat Ali Water Treatment Plant Sodium Dichromate Incident Status Update: May 2020](#) (APHC, May 2020)
- [Health Assessment of 2003 Al Mishraq Sulfur Fire Incident](#) (APHC, June 2012)
- [Joint Base Balad Burn Pit](#) (APHC)
- [Bagram Theater Internment Facility](#) (APHC)
- [Medical Assessment of Air Quality at Narhwan Brick Factory and FOB Hammer in Iraq](#) (APHC)



## Screening for Exposures Through Health Assessments

DoD is adding questions related to airborne hazards and open burn pit exposures to the periodic, separation, and deployment related health assessment forms. If an evaluation establishes that the service member was stationed at a location with an open burn pit or exposed to toxic airborne chemicals or contaminants, the FY20 National Defense Authorization Act states that the service member shall enroll in the Airborne Hazards and Open Burn Pit Registry, unless they elect not to enroll.

If you conduct these assessments, please encourage eligible service members to sign up for the registry at <https://veteran.mobilehealth.va.gov/AHBurnPitRegistry> or to visit <http://health.mil/AHBurnPitRegistry> for more information. Their participation supports ongoing VA research and informs future decisions around airborne hazards to keep service members and veterans healthy and safe.