

The seal of the Defense Health Board is a circular emblem. It features a central globe with a caduceus (a staff with two snakes) superimposed on it. The globe is set against a light blue background. The words "DEFENSE" and "HEALTH BOARD" are written in a circular path around the globe. Two stars are positioned on the left and right sides of the globe.

# **Public Health Subcommittee**

## **Decision Brief: Deployment Pulmonary Health**

**RADM (Ret) H. Clifford Lane, MD**

Defense Health Board  
August 11, 2014

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# Overview

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- Problem Statement
- Membership
- Timeline
- Briefings
- Structure of the Written Report
- Findings & Recommendations



# Problem Statement

(1 of 2)

- There is concern that inhalational exposures experienced by Service members and veterans who were deployed to Southwest Asia may be associated with development of pulmonary disease. Specific exposures of concern include particulate matter, emissions from burning waste, other fires, munitions, vehicles, and local industry, as well as personal habits such as smoking.
- Research to date evaluating associations between deployment exposures and chronic pulmonary disease has been inconclusive, although some studies have shown a possible association with acute respiratory symptoms.



# Problem Statement

(2 of 2)

- There is continuing debate about whether additional measures are needed to better establish baseline pulmonary status and pulmonary function prior to deployment, how to effectively screen and diagnose symptomatic Service members and veterans for chronic deployment-related pulmonary symptoms and disease, and what future research efforts are most needed.
- On January 20, 2012, the Acting Under Secretary of Defense for Personnel and Readiness requested the DHB review deployment-related pulmonary health issues and recommend a comprehensive approach for assessment and prevention, in addition to providing direction for future research and surveillance.



# Common Environmental Exposures

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# Location Specific Environmental Exposures

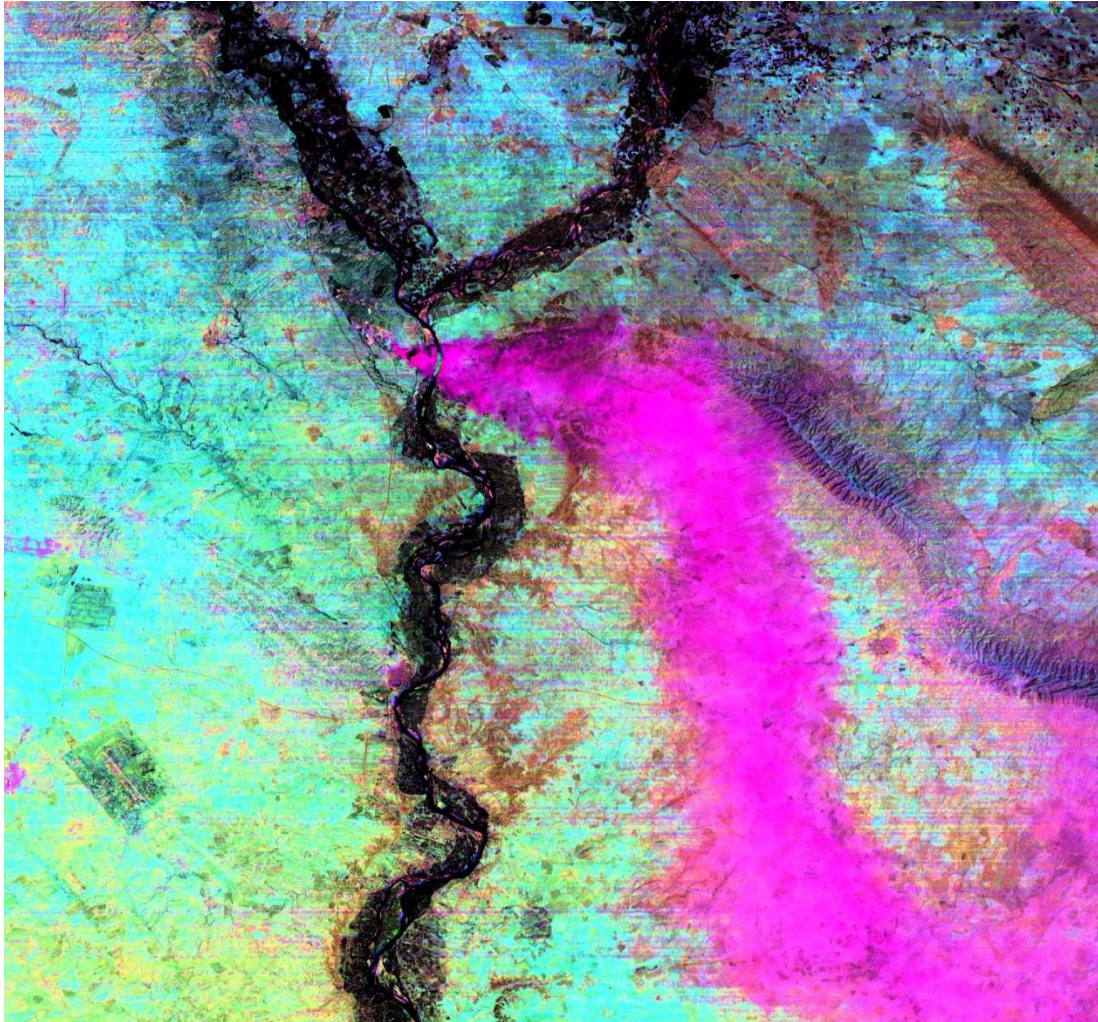
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# Event Specific Environmental Exposures



2003  
Al Mishraq  
Sulfur Fire

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ORIGINAL ARTICLE

# Constrictive Bronchiolitis in Soldiers Returning from Iraq and Afghanistan

Matthew S. King, M.D., Rosana Eisenberg, M.D., John H. Newman, M.D.,  
James J. Tolle, M.D., Frank E. Harrell, Jr., Ph.D., Hui Nian, Ph.D.,  
Mathew Ninan, M.D., Eric S. Lambright, M.D., James R. Sheller, M.D.,  
Joyce E. Johnson, M.D., and Robert F. Miller, M.D.

ABSTRACT





# Bottom Line

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- There is no doubt that deployed soldiers (whether to SW Asia or elsewhere) are exposed to situations that may lead to lung disease.
- There are inadequate data to provide any definitive cause and effect relationships with a specific exposure in SW Asia.
- Despite substantial effort there is still more that needs to be done.



# Membership

## Public Health Subcommittee

- RADM (Ret) H. Clifford Lane, MD (Chair)
- Sonia A. Alemagno, PhD
- Gary P. Carlson, PhD
- John D. Clements, PhD
- Steven Gordon, MD\*
- John Groopman, PhD
- David Lakey, MD
- James E. Lockey, MD, MS
- Gregory A. Poland, MD
- Maj (Ret) Joseph Silva, Jr., MD

*\*Nominee Pending Approval*



# Timeline

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**August 2013:** DHB subcommittee members convened to begin investigation.

**September 2013 – June 2014:** Members received briefings from the Services and subject matter experts to inform findings and recommendations.

**May 2013- July 2014:** Members developed draft report, and refined findings and recommendations for the DHB's consideration.



# Process

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- **9 Teleconferences**
- **6 Face-to-face meetings**
- **24 Briefings**
- **Discussion with 11 subject matter experts**
- **1 Public session, with 4 public statements**



# Briefings

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- Services
- Department of Veterans' Affairs
- National Institute of Occupational Safety and Health
- Vanderbilt University
- National Jewish Health
- Fire Department of New York
- Other subject matter experts in occupational spirometry, epidemiology, toxicology, pulmonology, and pathology



# Structure of the Written Report

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- Executive Summary
- Introduction
- Pre-Deployment Clinical Baselines and Post-Deployment Screening
- Diagnosis of Post-Deployment Pulmonary Symptoms and Disease
- Surveillance for Deployment Related Pulmonary Symptoms and Disease
- Deployment Pulmonary Health Registries
- Deployment Pulmonary Health Research Activities
- Deployment Related Pulmonary Disease Prevention



# Findings & Recommendations

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## Grading System for Recommendations

**I = Based on data from randomized, controlled trials**

**II= Based on observational cohort studies**

**III=Based on expert opinion**

# INTRODUCTION





# Introduction (1)

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- The potential association between deployment in OEF/OIF and pulmonary health has been examined in many studies.
- There is a consistent report of increased respiratory symptoms and illness when deployed are compared to non-deployed.
- This is particularly true for asthma and is not specific to SW Asia deployment.



## Introduction (2)

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- Active duty military personnel have higher levels of smoking across the services.
- One study associated smoking initiation among non-smokers and smoking resumptions among formers smokers with military deployment.
- Smoking is a prominent risk factor for many forms of pulmonary disease.

# **PRE-DEPLOYMENT CLINICAL BASELINES AND POST-DEPLOYMENT SCREENING**



# Pre-Post/Deployment Screening

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- Service members are required to maintain a high level of readiness.
- This is assessed through a series of questionnaires and evaluations.
- The questions relating to pulmonary health are not consistent on all questionnaires.
- It has been suggested that routine spirometry be used to periodically assess pulmonary function. This is not a trivial undertaking.



# Finding 2.1

## 1 of 2

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The current Department of Defense (DoD) pre-deployment screening questionnaire (DD2795) does not contain any pulmonary-specific questions and it does not contain the same questions as the two post-deployment questionnaires (DD2796, DD2900). The forms also do not sufficiently capture smoking history, such as number of pack-years smoked. Implementing a pre-deployment health assessment with as many identical questions to the post-deployment health assessments as logical will allow a direct comparison of baseline responses to post-deployment responses on both an individual and population level.



# Finding 2.1

## 2 of 2

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This will provide both a surveillance and research tool in detecting adverse trends. Although beyond the scope of this report, it was noted that health assessment questionnaires themselves have expanded over the years to a length and level of detail collected that appears to be beyond what may be needed for a screening tool. It may be of value to identify opportunities to reduce the length of the screening tool and develop more specific surveys to be completed when triggered by positive responses to the screening questions. In other words a more detailed pulmonary health questionnaire would be triggered whenever there was a positive response to a pulmonary health screening question.



# Recommendation # 2.1

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**DoD should add the same symptom questions to the pre-deployment questionnaire as are found on the post-deployment questionnaires (Question 11 in the Defense Department form 2796 and Question 8 in the Defense Department form 2900). Add “wheezing” to the symptoms question on all forms, as well as quantitative and qualitative questions about smoking behaviors.**

**Evidence Level: III**



## Finding # 2.2

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With the exception of the broader Airborne Hazards and Open Burn Pit Registry questionnaire, a single, standardized pulmonary questionnaire is not used across both DoD and the Department of Veterans Affairs (VA) in evaluating individuals with chronic post-deployment pulmonary symptoms. It would be helpful to use a single, standardized pulmonary questionnaire for clinical evaluations to allow for collection of a consistent set of data for epidemiologic analysis. If completion of this questionnaire were triggered by positive responses on the pre/post deployment health assessments, completed electronically, and included in the pre/post deployment assessment database, this would provide access for both surveillance purposes and evaluation of symptomatic individuals.





## Recommendation # 2.2

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**DoD should work with the Department of Veterans Affairs and other stakeholders to harmonize on the use of a single, standardized pulmonary questionnaire in evaluating patients who present with chronic post-deployment pulmonary symptoms. The questionnaire should not be cumbersome and should have clinical use.**

**Evidence Level: III**



# Finding # 2.3

## 1 of 2

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There have been no studies conducted on Service members who already have baseline occupational spirometry data as a consequence of their specific duty assignment, such as firefighters, to determine if an objective post-deployment decline in pulmonary function has occurred in association with deployment. Currently, spirometry results are not available in a centrally accessible electronic database. Longitudinal analysis of changes in pulmonary function by occupational group or location is impractical without this.



# Finding # 2.3

## 2 of 2

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Although a study by Morris et al of pre- and post-deployment spirometry is currently in progress on deploying soldiers and likely to provide useful data, it will not provide sufficient information on the challenges of maintaining a high level of quality assurance when multiple technicians at multiple locations are conducting large numbers of spirometry tests.



# Recommendation # 2.3a

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**DoD should:**

**a. Conduct an independent assessment of the quality of spirometry currently performed as part of occupational medical surveillance programs in each of the Services using the 2014 Official American Thoracic Society Technical Standards: Spirometry in the Occupational Setting as a guide. This should include analysis of key spirometric parameters previously obtained over at least a 5 year period of time with a statistical sample from several representative locations from each Service. This will provide a baseline assessment of the quality of spirometry in existing medical surveillance programs.**



# Recommendation # 2.3b

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**DoD should:**

**b. Implement a mechanism to routinely enter all occupational spirometry results into a centralized electronic database to allow for monitoring and analysis of trends in pulmonary function among occupational groups. Provide the capability for providers and population health officials to view graphical presentation of key spirometric parameters for individual and group data superimposed on expected results over time for visual detection of adverse trends. This will provide the capability for longitudinal surveillance and more efficient identification of adverse trends in populations and individuals.**



# Recommendation # 2.3c

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**DoD should:**

**c. Once sufficient quality control measures are found to be in place or are implemented, conduct a feasibility study assessing pre- and post-deployment spirometry in selected groups using quality assurance reviews as specified in the American College of Occupational and Environmental Medicine Guidance Statement: Spirometry in the Occupational Health Setting-2011 Update. This will identify the challenges in conducting a large-scale spirometry program while maintaining quality assurance.**

**Evidence Level: III**

# **DIAGNOSIS OF POST-DEPLOYMENT PULMONARY DISEASE**



# Diagnosis of Pulmonary Disease

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- A uniform, systematic approach to the diagnosis of pulmonary disease is desirable.
- Multiple algorithms are currently proposed including those by professional groups like the American Thoracic society.
- Some have advocated for a more aggressive use of lung biopsy to provide a diagnosis that would facilitate a disability determination.
- A lung biopsy, like any invasive procedure, is associated with a degree of risk.





# Finding #3.1

1 of 3

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The results of the King et al study initiated further dialogue on the necessary components of a clinical evaluation and diagnostic criteria for Service members returning from deployment with chronic pulmonary symptoms, of which dyspnea on exertion is of specific interest. The Denver Working Group and other investigators have provided recommendations for the evaluation of patients with chronic post-deployment dyspnea on exertion and there are many similarities in these approaches. A consistent approach to evaluation of these patients across DoD, the VA, and civilian institutions would facilitate accurate characterization of the diagnoses associated with this clinical presentation.



# Finding #3.1

## 2 of 3

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The use of surgical biopsy as a diagnostic tool in evaluating chronic dyspnea on exertion in the absence of chronic and significant, progressive symptoms or objective clinical findings based on non-invasive evaluation is not appropriate.

Although the risks associated with video-assisted thoracoscopic surgery (VATS) lung biopsy are low in a healthy, young population, it is an invasive procedure with some inherent significant risk.



# Finding #3.1

3 of 3

A summary of key principles for clinical evaluation of chronic post-deployment dyspnea includes:

- 1) A stepwise evaluation should be conducted until a diagnosis is established or further testing would not be of clinical benefit to the patient.
- 2) A comprehensive clinical evaluation of all potential causes of significant and progressive dyspnea should be completed prior to considering surgical lung biopsy.
- 3) If surgical lung biopsy is being conducted to study the prevalence and characteristics of disease without clear prognostic benefit to the patient, it should be conducted under an Institutional Review Board (IRB) approved protocol; and
- 4) There are clear medical indications for surgical lung biopsy. Qualification for disability compensation is not an appropriate indication for surgical lung biopsy.



# Recommendation # 3.1

1 of 3

**DoD should have clinicians use a consistent approach for the evaluation of chronic post-deployment pulmonary symptoms. A diagnostic approach for dyspnea on exertion greater than 3 months duration using a summary of approaches reviewed is included below as a reasonable starting point.**

## **Tier 1)**

- Medical and occupational history including pulmonary questionnaire**
- Physical exam with focus on cardiovascular and pulmonary findings**
- Body mass index**
- Spirometry including flow volume loops**
- Chest radiograph**
- Compare results with any previous available records**



# Recommendation # 3.1

2 of 3

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## **Tier 2)**

- **Spirometry with bronchodilators or methacholine challenge**
- **Lung volumes and diffusion studies**
- **Consider laryngoscopy (rest or exercise)**
- **Consider echocardiogram**

## **Tier 3)**

- **High resolution computed tomography (HRCT) scan (depending on potential diagnosis, may want prone and supine positions with full inspiratory and expiratory views)**
- **Six minute walk resting and exercise pulse oximetry**
- **Consider specific blood tests depending on differential diagnosis**



# Recommendation 3.1

3 of 3

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## Tier 4)

- **Maximum cardiopulmonary exercise tolerance testing with arterial blood gases pre-exercise and at maximum exercise**

## Tier 5)

- **Depending on results, follow with periodic repeat testing to determine potential adverse long-term trend or consider lung biopsy on a case-by-case basis if disease process is unknown and severe or progressive, and/or potentially amenable to therapy. Physician judgment and patient preference will continue to be key considerations**

**Evidence Level: III**



## Finding # 3.2

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The Post-Deployment Health Clinical Practice Guidelines are a tool to help clinicians in evaluation and management of care with regard to deployment-related health concerns. Given that a standardized method for evaluation of chronic dyspnea on exertion is not currently published on VA or DoD guideline websites, the development of clinical practice guidelines for evaluation of post-deployment pulmonary symptoms would improve consistency in post-deployment evaluation of patients. These guidelines could include recommendations for primary care providers as well as pulmonologists.



## Recommendation #3.2

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**DoD should publish a clinical practice guideline for evaluation of chronic post-deployment pulmonary symptoms on the VA/DoD Clinical Practice Guidelines website and the PDHealth.mil website. This guideline should include guidance for proper International Classification of Disease coding. To facilitate use of these guidelines, templates should be created within the electronic health record including health and occupational/exposure history and clinical evaluation elements.**

**Evidence Level: III**



# **SURVEILLANCE FOR DEPLOYMENT RELATED PULMONARY DISEASE**



# Surveillance

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- Occupational respiratory disease may be defined as the ongoing, systemic collection, analysis and dissemination of health and hazard data to monitor the extent and severity of occupationally-related lung disease.
- A variety of DoD assets have this as part of their mission.
- Some of these efforts are compromised by a lack of specific location data for personnel.



# Location Specific Environmental Exposures



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# Without Specific Coordinates the Epidemiology is Insensitive to Location Specific Risks





# In Other Words

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- If a disease has a background incidence of  $1/10,000$ ; in a sample of 100,000 you would expect 10 cases = background incidence.
- If 1000 of those individuals were assigned to a burn pit and had a 10-fold increased incidence ( $1/1000$ ) they would only add 1 case to the background number of 10.
- There would be no statistical difference between a total of 10 cases and 11 cases.



# Finding #4.1

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Epidemiologic studies are compromised by the lack of access to classified individual deployment location data. Thus far, DoD epidemiologists have been unable to identify the cohort of individuals potentially at highest risk of pulmonary disease due to lack of specific location data.



# Recommendation # 4.1

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**DoD should develop a mechanism to allow investigators to expeditiously access demographic information by specific deployment location, time period, and military occupational specialty in the conduct of approved research and surveillance. The Board supports the Assistant Secretary of Defense for Health Affairs' 2014 request to expedite declassification of individual location data to support epidemiologic research and surveillance.**

**Evidence Level: III**



# Finding # 4.2

## 1 of 2

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As outlined in the Baselines and Screening chapter, DoD currently electronically captures all the data entered on deployment health assessment forms. The 2012 revision of the post-deployment health assessment and reassessment forms includes specific questions related to pulmonary symptoms. The Armed Forces Health Surveillance Center (AFHSC) prepares periodic deployment reports, including summaries of deployment health assessment data. However, it does not appear that the data from the pulmonary related questions are routinely analyzed by the AFHSC or the Services to assess baseline population responses to these questions or to monitor adverse trends.





# Finding # 4.2

## 1 of 2

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There may be value in conducting this type of surveillance if careful thought is given to what would constitute an adverse trend sufficient to warrant follow-up investigation and who would conduct those investigations.



## Recommendation # 4.2

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**DoD should conduct routine analyses of aggregate [symptom]response data from pre-deployment health assessment, post-deployment health assessment, and post-deployment health re-assessment forms by deployed location, unit, and/or other levels, to identify normal background response rates and adverse trends.**

**Evidence Level: III**



## Finding #4.3

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Clinical and epidemiologic researchers have reported that inaccuracy in International Classification of Disease (ICD) coding of medical encounters has impeded efforts in conducting surveillance and research. Inaccurate ICD coding may result in misclassification with falsely increased and/or decreased numbers of specific diagnoses. This may lead to overestimating or underestimating the significance of an observed trend, making it difficult to determine if additional scrutiny is warranted.



## Recommendation #4.3

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**DoD should investigate mechanisms to improve International Classification of Disease coding in the electronic health record (EHR). Including an appropriate decision support system in the next generation EHR may be one mechanism to consider.**

**Evidence Level: III**

# **DEPLOYMENT PULMONARY HEALTH REGISTRIES**



# Registries

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- A registry can be defined as a “prospective observational study of subjects with certain shared characteristics, that collects ongoing and supporting data over time on well-defined outcomes of interest for analysis and reporting”.
- There are currently several registries related to deployment pulmonary health.
- The Vision Center of Excellence was identified a DoD/VA best practice in this area.



# Finding #5.1

## 1 of 2

There are a series of registries currently in operation that are capturing data in an effort to better characterize the nature and scope of potential deployment-related pulmonary disease. However, there is no enterprise-wide clinical registry for chronic deployment-related pulmonary symptoms or disease. Establishing a registry of this nature would allow DoD to better assess the magnitude of the problem and provide a more effective tool to assess the best diagnostic and treatment modalities.



# Finding #5.1

## 2 of 2

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Providing a mechanism for DoD, VA and civilian institutions to participate in this registry would be the only way to allow for all relevant cases to be included. The Defense and Veterans Eye Injury and Vision Registry was identified as an existing registry that was serving this purpose for ocular conditions.





# Recommendation #5.1

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**DoD should implement an enterprise-wide clinical registry of deployment-related chronic pulmonary symptoms or disease. The Defense and Veterans Eye Injury and Vision Registry could be used as a model. This registry should incorporate the Study of Active Duty Military for Pulmonary Disease related to Environmental Dust Exposure (STAMPEDE) registry, reach out to other registries, and provide a mechanism for including cases evaluated at the VA and civilian institutions.**

**Evidence Level: III**

**DEPLOYMENT  
PULMONARY HEALTH  
RESEARCH ACTIVITIES**



# Research

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- An array of deployment pulmonary health research activities are taking place in the DoD and VA ranging from epidemiologic studies to basic research.
- Despite an impressive level of effort there are several key questions that are not being addressed and overall coordination was not clear.
- Multiple challenges to conducting research were reported to the subcommittee.



# Finding #6.1

## 1 of 3

Currently, there is no comprehensive effort to track Service members and veterans with persistent post-deployment pulmonary symptoms or disease. To sufficiently study the long-term pulmonary consequences of deployment, it is necessary to have long-term, high quality follow-up. An observational cohort study of Service members and veterans who develop chronic post-deployment pulmonary symptoms or disease would help characterize the nature and proportions of specific diagnoses established over time, provide prognostic information, and may yield insight as to the best practices for evaluating and treating these individuals.



# Finding #6.1

## 2 of 3

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Expansion of the STAMPEDE III study taking place at Brooke Army Medical Center to include all individuals, whether or not deployed, with unexplained dyspnea as well as all Services and the VA would be one approach. Conducting additional sub-studies within the Millennium Health Cohort would provide further insight into deployment-related chronic pulmonary symptoms or disease.



# Finding #6.1

## 3 of 3

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The STAMPEDE series of studies are focused on practical questions related to the establishment of clinical baseline information, feasibility and utility of spirometric surveillance, and clinical evaluation of chronic post-deployment pulmonary symptoms with longitudinal follow up in a military population. These studies provide a unique opportunity to obtain information that may provide some of the best evidence in addressing the specific questions posed to the Subcommittee. Continued and expanded support of these efforts in the way of resources and staff, including incentives to reduce loss to follow-up, is advised and may assist in fulfilling other recommendations.



# Recommendation #6.1

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**DoD should:**

- a. Conduct a prospective observational cohort study of Service members and veterans with unexplained chronic dyspnea. Approaches might include expansion of the STAMPEDE III study and STAMPEDE registry.**
- b. Provide resources necessary to ensure the STAMPEDE series of studies are able to accomplish their aims in a manner that maximizes internal validity and allows sufficient long-term follow up of registry patients.**
- c. Provide resources necessary to conduct further studies of deployment-related chronic pulmonary disease within the Millennium Health Cohort.**

**Evidence Level: III**



# Finding #6.2

## 1 of 2

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A number of individuals have received surgical lung biopsies as part of their evaluation for post-deployment pulmonary symptoms. It is not evident that systematic follow-up of these individuals has been conducted to determine prognosis associated with specific pathological findings, responses to treatment, or long-term morbidity associated with the biopsy, such as chronic pain.





# Finding #6.2

## 2 of 2

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Although the Board does not support [continued] use of surgical lung biopsies for diagnostic purposes in the absence of other supporting clinical indications, a comprehensive follow up of these individuals would provide valuable prognostic data on this group. This could be a substudy of the cohort study in Recommendation 6.1 and may benefit from comparing those with similar symptoms of similar severity who did not receive lung biopsy to determine differences in prognosis or morbidity as well as level of disability rating.



## Recommendation #6.2

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**DoD should conduct a prognostic study of all Service members or veterans who have undergone surgical lung biopsies for post-deployment pulmonary symptoms to assess prognosis associated with specific histologic diagnoses and morbidity associated with the procedure itself.**

**Evidence Level: III**



# Finding #6.3

## 1 of 3

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DoD has made progress in coordinating tri-Service research efforts with the establishment of the Joint Program Committees to provide oversight for the selection and funding of priority research projects. Additionally, the VA/DoD Health Executive Council Deployment Health Working Group, the Military Operational Medicine Research Area Directorate Pulmonary Working Group, and the Denver Working Group have provided direction for research gaps and priorities. However, research activity within the area of deployment related pulmonary disease would benefit from improved coordination and direction.



# Finding #6.3

## 2 of 3

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Oversight by a single official with authority to determine research priorities and allocate or re-allocate funding for the DoD deployment pulmonary health research portfolio would foster coherent, complementary, collaborative efforts in accomplishing priority research. The current sources of information for ongoing, recently awarded, and proposed DoD research are located on multiple websites or simply are not posted.



# Finding #6.3

## 3 of 3

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Thus, it is difficult to efficiently locate information related to ongoing or proposed research. Having easy access to such information would provide investigators with a tool to reduce duplication, locate collaborators, and design research to complement studies already in progress. An electronic IRB system would be one way to provide visibility of submitted and approved clinical research proposals from across DoD.



# Recommendation #6.3

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## **DoD should:**

- a. Designate a single office with the authority to determine priorities and allocate or re-allocate funding for the DoD deployment pulmonary health research portfolio.**
- b. Create one web portal from which information on all historical, ongoing, and recently awarded deployment-related (or all) health research projects may be accessed.**
- c. Hold, at a minimum, annual meetings with investigators to discuss research.**
- d. Link DoD's electronic Institutional Review Board system so that any authorized investigator at any site can review, at a minimum, titles and abstracts of all submitted and approved research projects.**

**Evidence Level: III**

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# Finding # 6.4

## 1 of 2

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The Joint Pathology Center estimates they have approximately 1,000 (non-neoplastic) surgical lung biopsy specimens from Operation IRAQI FREEDOM (OIF) and Operation ENDURING FREEDOM (OEF) era patients, of which about half are from patients who deployed to Iraq or Afghanistan. The Armed Forces Medical Examiner System has conducted over 5,000 autopsies since 2001.



# Finding # 6.4

## 2 of 2

Lung tissue specimens may be available from a large proportion of these autopsies. Conducting a histological examination of a representative number of these samples may provide insight to the question of whether exposure to particulate matter (PM) or other inhalational exposures in Southwest Asia was associated with objective findings of lung damage compared to those who had not deployed. Multiple civilian and military researchers have commented on the potential value of this information. In particular, a study of this nature may provide insight on issues related to constrictive bronchiolitis.





## Recommendation #6.4

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**DoD should conduct a histologic study of autopsy and biopsy lung tissue from Service members who deployed to Southwest Asia compared to those who did not deploy or deployed to other theaters of operation in order to determine if there are characteristic histologic changes associated with deployment to areas with high levels of airborne particulate matter such as Southwest Asia.**

**Evidence Level: III**



## Finding #6.5

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Despite the substantial number of publications describing the elevated levels of PM in Southwest Asia, there is limited research on personal respiratory protective equipment (PPE) specifically for PM for military field use.



# Recommendation #6.5

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**DoD should continue research to develop personal respiratory protective equipment appropriate for field or combat use to reduce particulate matter exposures.**

**Evidence Level: III**

# **DEPLOYMENT RELATED PULMONARY DISEASE PREVENTION**



# Prevention

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- Prevention may be classified as:
  - Primary: Preventing initial development of disease
  - Secondary: Early detection of disease
  - Tertiary: Reducing the impact of disease
- While environmental pollutants may contribute to a decline in pulmonary status the one clearly definable target for primary prevention is smoking cessation.



# Finding #7.1

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Smoking is a known risk factor for cardiovascular and pulmonary diseases, including chronic obstructive pulmonary disease (COPD) and cancer. Secondhand smoke exposure has been causally linked to cancer, respiratory disease, and cardiovascular disease. A relatively high percentage of Service members are current smokers, thereby increasing their risk for development of these diseases. The Military Health System has a number of initiatives and has prioritized supporting smoking cessation and prevention of initiation. Continued tobacco cessation efforts would help reduce preventable morbidities in Service members.



# Recommendation #7.1

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**DoD should continue to provide tobacco cessation programs and reduce acceptance of tobacco use (e.g., smoke-free bases, educational campaigns).**

**Evidence Level: II**



## Finding #7.2

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Finding 7.2: Military members operate in many parts of the world where PM levels and other air pollutants are higher than in the United States. PM has been shown to have adverse acute and chronic health effects depending on dose, duration, and susceptibility factors. Reports indicate regulations governing operation of open burn pits have not been adequately enforced and waste management practices could be improved. Better characterization of individual environmental and occupational exposures may help to identify potential risks to long-term health. Continued analyses and monitoring of PM and associated air quality measures would allow commanders to determine when additional preventive measures, such as respiratory PPE, may be appropriate. Current challenges in providing respiratory protection for PM are outlined in the US Army Public Health Command fact sheet on Particulate Matter (PM) Air Pollution Exposures During Military Deployments.





# Recommendation #7.2

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**7.2 a. DoD should continue efforts to better characterize (quantitatively and qualitatively), and minimize, individual environmental and occupational exposures.**

**7.2b. DoD should improve enforcement of existing regulations on the operation of open burn pits and improve overall waste management practices.**

**7.2c. DoD should provide appropriate personal protective equipment to reduce hazardous exposures, such as high particulate matter levels.**

**Evidence Level: III**



# Finding #7.3

## 1 of 2

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Impairment from pulmonary disease can have financial, social, and psychological effects on both patients and their families. Patients and families have indicated navigating both the medical evaluation and treatment system (especially as a Reserve component member) and the disability evaluation process can be challenging. In situations where medical professionals are unable to provide a specific diagnosis, there may be additional stress related to the uncertainty of whether or not they may qualify for medical discharge or disability benefits in conjunction with not being able to adequately carry out their civilian or military occupation.



# Finding #7.3

## 2 of 2

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Providers have indicated that military members with potentially disabling pulmonary symptoms of unknown cause may receive appropriate medical evaluation board processing and qualification for disability benefits without a histological diagnosis if a comprehensive evaluation is completed and an appropriate narrative is provided by the specialty consultant.



## Recommendation #7.3

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**Rec 7.3: DoD should review the range of current resources available to support patients, families, and providers in dealing with chronic pulmonary symptoms/disease and, with stakeholder input, identify gaps or deficiencies and make improvements. This review should include access to care, the disability evaluation processes, and other available resources such as support groups, to improve patient-centered outcomes.**

**Evidence Level: III**



# Closing Remark

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“Even if there is no association between deployment and a disease it does not mean that a soldier does not have a disease”

Daniel Sullivan

President and General Manager

Sergeant Thomas Joseph Sullivan Center

DoD/VA Workshop on Airborne Hazards

August 13, 2013