

ABOUT RESPIRATORY HEALTH

• Two examples of respiratory diseases that can restrict breathing are asthma and chronic obstructive pulmonary disease (COPD).

• Asthma is a chronic inflammatory disease in which the airways narrow and may become filled with excess mucus, making it hard to breathe. While it cannot be cured, the symptoms can be controlled.

• COPD is a group of diseases that limit airflow and make it hard to breathe. COPD most commonly includes two conditions: emphysema (in which the air sacs of the lung are damaged and enlarged), and chronic bronchitis (a long-lasting cough caused by chronic inflammation of the bronchial tubes). Most people with COPD have both conditions.

• Veterans may suffer from other respiratory problems through exposure to infectious agents or airborne environmental hazards. Examples of respiratory diseases that may be caused by infectious agents are tuberculosis, lung cancer, and pneumonia.

• Many Veterans were exposed to airborne environmental hazards during military service, such as Agent Orange, burn pits, sandstorms, or fumes from aircraft exhaust. • Veterans who develop respiratory cancer (cancer of the lung, throat, or windpipe) and were exposed to <u>Agent Orange</u> or other herbicides during military service may be eligible to receive VA health care and disability compensation.

VA research on

RESPIRATORY HEALTH

VA researchers are advancing the understanding, prevention,

and treatment of numerous respiratory illnesses, ranging

from the common cold and pneumonia to major public

health threats such as tuberculosis and lung cancer.

VA RESEARCH ON RESPIRATORY HEALTH: OVERVIEW

• VA research on respiratory health covers a wide range of topics, including tuberculosis, lung cancer and smoking, influenza, and pneumonia. VA research has also focused on the COVID-19 pandemic. Featured respiratory research also includes sleep apnea, chronic obstructive pulmonary disease, and respiratory infections.

• VA research over the decades has made important advances in respiratory health, such as helping to establish the link between smoking and lung cancer, and determining the best way to treat tuberculosis with antibiotics.

• VA's Office of Public Health (OPH) works with all levels of government to prepare for possible pandemic influenza (flu) outbreaks. OPH researchers are also actively studying airborne hazards like burn pits and other military environmental exposures that may affect respiratory health.

• The <u>War Related Illness and Injury Study</u> <u>Center</u> (WRIISC) is a national program dedicated to Veterans' post-deployment health concerns and unique health care needs. Through the <u>Airborne Hazards and Burn</u> <u>Pits Center of Excellence</u>, WRIISC conducts clinical and translational research related to airborne hazards and burn pits focusing on a range of health concerns, including respiratory problems and unexplained shortness of breath (dyspnea).

• Respiratory problems are the leading cause of death in Veterans and others who have spinal cord injury (SCI). VA's <u>Center of</u> <u>Excellence on the Medical Consequences of</u> <u>Spinal Cord Injury</u>, located in New York, is studying ways to treat complications of SCI, including breathing difficulties.

SELECTED MILESTONES AND MAJOR EVENTS

1946 – Developed and tested effective therapies for tuberculosis through multicenter clinical trials that led to the development of the VA <u>Cooperative</u> <u>Studies Program</u>

1950 – <u>Concluded</u> there is "strong circumstantial evidence" linking cigarette smoking with respiratory tract cancers

2013 – Found that sleep apnea and poor sleep quality predicted diabetes, independent of other diabetes risk factors or mental health status

2014 – <u>Learned</u> that treatment for pneumonia that included the antibiotic (*Continued on back*)



RESPIRATORY HEALTH

azithromycin (Zithromax) was associated with a significantly lower risk of death and a slightly increased risk of heart attack

2016 – Developed a <u>blood test</u> to determine the causes of upper respiratory illness, to help ensure antibiotics are used appropriately

2019 – <u>Learned</u> that artificial intelligence techniques can improve the ability to diagnose lung cancer

2020 – <u>Found</u> that wearing face masks to prevent infection does not increase the amount of carbon dioxide in the blood stream

RECENT STUDIES: SELECTED HIGHLIGHTS

• Wearing a face mask does not affect oxygen and carbon dioxide levels in the blood, found a Miami VA study. During the COVID-19 pandemic, some individuals suggested that wearing face masks could cause health risks. Researchers measured gas exchange levels in subjects during a walking test. They concluded that wearing a face mask to prevent infection does not pose a risk to breathing, even in subjects with severe lung impairment. (*Annals of the American Thoracic Society*, March 2021)

• A study by VA researchers revised how risk of death from pulmonary hypertension is measured. Pulmonary hypertension is a type of high blood pressure that affects the arteries of the lungs. It is measured by Wood units, the amount of resistance against blood pushing through the lungs. Previous standards set 3.0 Wood units as the threshold at which patients were in danger, but the VA study found that patients with a score of 2.2 Wood units or higher are at risk for death and heart failure. (*Lancet*, Sept. 2020)

• Gastroesophageal reflux disease (GERD) may accelerate COPD progression, found a study by Minneapolis VA researchers. In GERD, stomach acid flows back into the esophagus, which can cause damage. GERD commonly occurs along with COPD. Patients with GERD showed small but significant increases in decline of COPD measures, compared with those without GERD. (*Respiratory Research*, Aug. 3, 2020)

• HIV-positive men were more likely to have abnormal lung functioning than men without HIV, found a Minneapolis VA study of 1,100 men. HIV-positive men showed lower capacity to transfer oxygen to the blood during breathing tests. Low diffusing capacity has been linked to poorer quality of life and health problems. The reasons for the difference are not yet clear. (*AIDS*, July 1, 2020)

• Many Iraq and Afghanistan Veterans may have undiagnosed breathing problems, according to a study by VA New Jersey researchers. The researchers tested the breathing of 24 Veterans without asthma who were not seeking treatment for breathing problems. They found the rate of exercise-induced bronchoconstriction (EIB)—narrowing of the airways in the lungs—was 17%, similar to that in the general population. However, an additional 42% of participants had a probable constriction response that did not meet the full diagnostic criteria for EIB. (*Military Medicine*, March 2, 2020)

• A study by the VA Office of Patient Care Services did not find a link between herbicide exposure in Vietnam and restrictive pulmonary disease. While participants who sprayed herbicides during their service showed more lung restriction than those who did not, the difference was not statistically significant. Race and waist circumference were much more predictive of restrictive pulmonary disease. (International Journal of Environmental Research and Public Health, Aug. 28, 2019)

• Artificial intelligence programs can diagnose lung cancer better than physicians, found a study including a Palo Alto VA researcher. The researchers used computer software to review nearly 8,000 computed tomography (CT) scans and compared the results with readings by six lung cancer specialists. The computer accurately detected cancer in 5% more cases than the specialists, and reduced false positives by 11%. (*Nature Medicine*, June 2019)

For more information on VA studies on respiratory health and other key topics relating to Veterans' health, please visit www.research.va.gov/topics

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