

WTC first responders are at higher risk for obstructive sleep apnea and PTSD

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Mary Ann McLaughlin, M.D., M.P.H., is principal investigator for the WTC-CHEST Program at Mount Sinai, a subset of the World Trade Center Health Program Clinical Center for Excellence at Mount Sinai. Credit: Mount Sinai

Icahn School of Medicine at Mount Sinai researchers have linked high levels of exposure to inhaled particulate matter by first responders at Ground Zero to the risk of obstructed sleep apnea and post-traumatic stress disorder (PTSD), both conditions that may impact cardiovascular health.

The two separate studies were both presented on March 20 at the American Heart Association's EPI/NPAM 2014 Scientific Sessions in San Francisco, California by cardiologist Mary Ann McLaughlin, MD, MPH, principal investigator for the WTC-CHEST Program at Mount Sinai, a subset of the World Trade Center Health Program Clinical

Center for Excellence at Mount Sinai.

"Our study shows high exposure to the massive dust cloud of air pollution at Ground Zero has increased the risk among first responders of both obstructive [sleep apnea](#) and PTSD," says Dr. McLaughlin of the WTC-CHEST Program at Mount Sinai. "As a result, this puts our 9/11 first responders at higher risk of developing heart disease."

Due to 9/11 tragedy first responders at Ground Zero were exposed to varying levels of a dust cloud of air filled with cement dust, smoke, glass fibers, and heavy metals. The WTC-CHEST Program at Mount Sinai has previously linked this particulate matter exposure to lung, heart, and kidney disease abnormalities. Now the research team's studies found further research evidence linking sleep apnea and PTSD to exposure of the 9/11 particulate matter.

In each of the two analyses, researchers studied the same WTC-CHEST Program population of more than 800 participants between January 2011 to September 2013 with varying exposure to particulate matter ranging from very high, high, intermediate, and low, taking into account each first responder's time of arrival, proximity, duration, and level of exposure at Ground Zero.

"Elevated exposure to the particulate matter from 9/11 caused upper airway inflammation and is a significant contributing factor to the pathogenesis of [obstructive sleep apnea](#)," says Dr. McLaughlin. "There is strong evidence in our study data showing a significant risk of inhaled particulate matter exposure and risk of obstructed sleep apnea in the studied group of WTC first responders."

In addition, researchers linked particulate matter inhalation to the high risk of PTSD. Study results show those with very high or high exposure were more likely to have PTSD. Also, they found that those responders

with PTSD also had elevated biomarkers for increased cardiovascular disease risk including high sensitivity C-reactive protein (hsCRP), a key biomarker of inflammation indicative of increased cardiovascular risk. Those WTC responders with PTSD had significantly higher hsCRP levels.

"High levels of exposure to particulate matter may lead to sleep apnea and PTSD, and as a result a high risk factor for cardiovascular disease," says Dr. McLaughlin. "As a result of our new study findings, we plan to further closely monitor our WTC first responders for heart disease warning signs."

This research study was funded by the Centers for Disease Control and Prevention (CDC) and the National Institute of Occupational Safety and Health (NIOSH).

Dr. McLaughlin is the principal investigator for the WTC-CHEST Program at Mount Sinai evaluating the effects of exposure in WTC responders 10-14 years following the events of 9/11. The research studies seek to further examine the relationship between pulmonary and cardiac function abnormalities, other markers of chronic cardiopulmonary disease, kidney dysfunction, and further elucidate the pathophysiologic effects of exposure to inhaled [particulate matter](#) on 9/11.

The WTC Health Program, Clinical Center of Excellence at Mount Sinai is a treatment and monitoring program for emergency responders, recovery workers, residents, and area workers who were affected by the terrorist attacks in New York City on September 11, 2001. The program identifies mental and physical health problems needing timely treatment; evaluates the health of first responders; monitors the development of symptoms; and researches the effects of 9/11 through data collection and analysis. Located at Mount Sinai and several other clinics in the tri-state

area, the Clinical Centers of Excellence and Data Centers are the result of the James Zadroga 9/11 Health and Compensation Act, which provides \$4.3 billion in federal funding to serve the health needs of the brave men and women impacted by the WTC tragedy.

Provided by The Mount Sinai Hospital

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