

Standard assessments miss early signs of cardiovascular disease in firefighters

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Traditional first-line checks of such heart disease risk factors as cholesterol, blood pressure and smoking habits aren't nearly good enough to identify cardiovascular disease in otherwise healthy, young firefighters, according to results of a small Johns Hopkins study.

Previous studies have found that cardiovascular disease accounts for 45 percent of deaths of on-duty [firefighters](#) nationwide, in contrast to 15 percent of deaths among those with conventional occupations, with heart attack being the number one cause of death. The Johns Hopkins researchers designed their study to identify firefighters at risk long before they show symptoms or have a heart attack. One such method, they report, is cardiovascular imaging.

"If we had just done traditional risk factor assessments, we would have missed each one of those firefighters who we discovered were at risk for a [cardiovascular event](#)," says study leader Elizabeth V. Ratchford, M.D., an assistant professor of medicine at the Johns Hopkins University School of Medicine and director of the Johns Hopkins Center for Vascular Medicine.

"These were young firefighters, with an average age of 46, who were otherwise healthy. By looking beyond the traditional methods of determining risk and using imaging, we were able to find plaque buildup in the coronary and carotid arteries or thickening of the carotid artery in the majority of the firefighters we studied," she adds.

A report on the research is published in the May 1 issue of the *American Journal of Cardiology*.

M. Dominique Ashen, Ph.D., C.R.N.P., a nurse practitioner in the Ciccarone Center for the Prevention of Heart Disease at Johns Hopkins and another study leader, says that a traditional risk assessment for cardiovascular disease involves checking blood pressure, cholesterol levels and weight; evaluating for diabetes; taking a family history; calculating the 10-year risk of having a cardiovascular event; and asking about lifestyle factors such as smoking, diet and exercise.

In the new study, 50 firefighters from Baltimore and Howard counties in Maryland were assessed in the traditional ways, but also with a CT scan to search for [coronary artery calcium](#) (calcified plaque) and an ultrasound test to search for carotid plaque and measure the thickness of the carotid artery (cIMT).

Although all the firefighters were without cardiovascular symptoms, the researchers found that two-thirds of the participants (33 of 50) had carotid plaque and/or thickening of the carotid artery greater than levels in the 75th percentile of values known to reflect risk. Coronary artery calcium was found in 11 subjects (22 percent) using the CT scan, while [carotid artery](#) plaque was found using cIMT in 18 of them (36 percent). There were some firefighters who had both coronary and carotid plaque.

The use of an aspirin and statin were recommended for all firefighters with plaque.

Strikingly, Ratchford says, the researchers also found that 50 percent of the firefighters in the study had prediabetes, and 2 percent had diabetes. Only 14 percent had a normal body mass index, with 38 percent overweight and 48 percent obese.

The researchers say they aren't sure why firefighters are at increased risk of cardiovascular disease, though the high risk and stress of the job combined with poor lifestyle habits could play a role.

As a second part of the study, the firefighters received lifestyle interventions to prevent or mitigate the cardiovascular problems identified by the Johns Hopkins team. The results have not yet been published.

"We are here to help them understand that prevention of cardiovascular disease is important and that the earlier we identify risk factors for cardiovascular disease or plaque in their arteries, the sooner we can work to reduce the risk of a major cardiovascular event, such as heart attack," Ashen says.

The researchers say that the cost of prevention, including both traditional risk assessment and imaging, is likely to be substantially less than the cost of disability or death from cardiovascular disease. Howard County Department of Fire and Rescue Services data indicate that the cost for one firefighter for one year of cardiovascular disease-related disability ranges from \$250,000 to \$400,000, with a cardiovascular disease-related death benefit of \$80,000. They hope to develop a cost-effective, model cardiovascular disease prevention program for firefighters that can be applied throughout the nation.

The researchers argue that [cardiovascular disease](#) risk assessment and risk reduction should begin when firefighters first enter the department to identify those at increased risk so that they can be targeted for and maintained on aggressive prevention strategies throughout their careers.

Provided by Johns Hopkins University School of Medicine

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