

# Severity of combat injury linked to future chronic diseases

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Iraq and Afghanistan war veterans are more likely to develop chronic diseases based on the severity of their combat injuries, according to research in the American Heart Association journal *Circulation*.

In the last 13 years of war, 52,087 U.S. service members have been wounded in combat in Iraq and Afghanistan. The [chronic diseases](#) that may occur after [combat injuries](#) may be a hidden cost of the conflicts.

"The more severely a service member is injured, the more likely they are to develop a wide variety of [chronic medical conditions](#), including [high blood pressure](#), diabetes, chronic kidney disease and hardening of the arteries," said Major Ian J. Stewart, M.D., lead study author and researcher at the Clinical Investigation Facility at David Grant Medical Center, Travis Air Force Base in California.

"I have seen firsthand that our soldiers, sailors, airmen and marines get the finest trauma and follow-up care," said Stewart, who has cared for wounded service members in Afghanistan and the United States. "Our study lays important ground work to better understand the longer-term effects of combat-related injury on the risk of chronic disease."

Researchers analyzed 3,846 soldiers' Injury Severity Scores (ISS), which assess how badly a patient is injured, and examined its relation with the subsequent development of chronic medical conditions. Only data from service members' first admission from February 2002-February 2011 were analyzed and all injuries were severe enough to require admission

to an intensive care unit. Patients were followed until they died, left the military healthcare system or until January 2013 (whichever came first).

The ISS ranges from 1 to 75, with 1 being a minor injury and 75 being a severe, likely un-survivable injury. For every 5 points that the ISS rose, the risk of high [blood pressure](#) increased by 6 percent; coronary artery diseases and diabetes by 13 percent; and chronic kidney disease by 15 percent.

Researchers also found:

- Those who developed chronic illnesses tended to be older, had higher average ISS and had more acute kidney injury.
- When trauma was complicated by acute kidney injury, the risk of high blood pressure increased by 66 percent and the risk of [chronic kidney disease](#) was almost five times more likely.
- Injured black service members had 69 percent higher rates of high blood pressure compared to injured whites.
- The ISS score was associated with an increased incidence of each chronic illness independent of the risk of death, even after considering age, race, heart rate, presence of burn injury and [acute kidney injury](#).
- For the most severely injured, the rates of high blood pressure, coronary artery disease and diabetes were notably higher compared with rates for the overall U.S. military population.

The association between ISS and long-term disease may be due to inflammation, researchers said. The body's inflammatory response to injuries was associated with each of the diseases in the study.

Also, post-traumatic stress disorder, common in combat casualties, may lead to similar results directly through an inflammatory response or indirectly from weight gain or substance abuse, researchers said.

Provided by American Heart Association

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