

# Aggressive management of gunshot wounds to brain significantly increases survival

January 24 2014, by Jo Marie Barkley

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(Medical Xpress)—About nine out of 10 people with gunshot wounds to the brain will die. University of Arizona trauma surgeons, using a new

aggressive resuscitation protocol for patients with gunshot head injuries, have increased survival to nearly five out of 10 victims, according to a recent study published by in *The American Journal of Surgery*.

That protocol was in place when former U.S. Rep. Gabrielle Giffords was taken to The University of Arizona Medical Center after being shot in the head on Jan. 8, 2011.

Gunshot wounds to the brain are the most lethal of firearm injuries, with survival rates of 10 percent to 15 percent. Because of the high mortality rate, aggressive management often is not given to the most severely injured [patients](#), said Dr. Bellal Joseph, UA assistant professor of surgery and the study's lead author.

However, military reports on the use of aggressive operative procedures for gunshot wounds to the brain have shown higher survival rates, Joseph said. Dr. Peter M. Rhee, professor and chief of the UA Division of Trauma, Critical Care, Burn and Emergency Surgery, and the study's senior author, used this aggressive management protocol while serving as a military trauma surgeon in Iraq and Afghanistan. Drawing from these reports and Rhee's experience, UA researchers at the UAMC Level 1 Trauma Center began aggressively resuscitating all patients with gunshot wounds to the brain in 2008.

Irrespective of how they scored on the Glasgow Coma Scale (a neurological scale used to measure levels of consciousness in a person following a brain injury), 132 patients with gunshot wounds to the brain received an aggressive management protocol. The protocol included blood products and hyperosmolar therapy to reduce intercranial pressure, thereby promoting long-term survival and recovery.

"After starting the new resuscitation methods, the [survival rates](#) started to improve immediately. There was an increase year after year and

during the last year of the study 46 percent of those patients survived," Joseph said.

Results of the five-year, single-site study also showed the adoption of aggressive management of gunshot wounds to the brain aided in the preservation of organs in nonsurvivors, increasing the number of organs procured per donor from 1.3 percent to 2.8 percent.

"Aggressive management is associated with significant improvement in survival and organ procurement in patients with gunshot wounds to the brain. Low outcome scores and the bias of resource use can no longer be used to preclude trauma surgeons from abandoning aggressive attempts to save these patients," Rhee said.

The study, funded by the UA Department of Surgery, is one of a number of research efforts by [trauma surgeons](#) at the Department of Surgery's Division of Trauma, Critical Care, Burn and Emergency Surgery. Faculty, fellows and residents in the trauma division have published more than 35 peer-reviewed articles and book chapters this year alone, surpassing any previous year at the UA. Most Level 1 trauma institutions have three or four research articles published annually.

Among the UA projects – and currently under review by top medical journals – are research on the epidemiology of trauma and the tracking of gun-related injuries and death trends.

"Trauma research is really important," Rhee said. "The successful recovery of U.S. Congresswoman Gabrielle Giffords is an example of the benefit of evidence-based treatments for the management of patients with [gunshot wounds](#) to the [brain](#)."

"We can impact one person at a time in the hospital, but [trauma](#) research impacts millions."

Provided by University of Arizona

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