

New tool may predict survival after gunshot wounds

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Researchers have developed a first-of-its-kind tool to help predict a person's chance of survival after a gunshot wound in the head or other penetrating injury, according to a new study published in the October 26, 2016, online issue of *Neurology*, a medical journal of the American Academy of Neurology. It's called the SPIN-Score, which stands for Surviving Penetrating Injury to the Brain.

"Gunshot wounds are the number one cause of penetrating traumatic brain injuries," said study author Susanne Muehlschlegel, MD, MPH, of the University of Massachusetts Medical School in Worcester, Mass., and member of the American Academy of Neurology. "Much of our knowledge about surviving such injuries comes from the battlefield, not from shootings among civilians. Being better able to determine the average person's chance of survival could help doctors and families make important decisions about medical treatment."

For the study, researchers looked back at 10 years of data from two level-one trauma centers, one in Massachusetts and one in Maryland. They examined the medical records of 413 people, 87 percent men, 56 percent black, with an average age of 33. Everyone had been treated for a penetrating injury to the brain, in most cases caused by gunshots. They then looked to see what factors were associated with surviving the injury, both in the hospital and six months later.

Two factors were by far the strongest predictors of survival: how well a person's pupils responded to light and how well the person could move in response to stimuli, such as obeying commands or withdrawing from pain, which is part of the motor tests in the Glasgow Coma Scale. The researchers found several other predictors of survival, but the first two were so strong that the rest improved the accuracy of their prediction only slightly. Overall, the SPIN-Score correctly predicted whether people

would survive with an excellent accuracy of 96 percent.

The survival rate overall was 42 percent; no participants died in the six months after leaving the hospital. Women had a 76 percent higher chance of survival, but exactly why is unclear. There was an 80 percent increased odds of dying if a gunshot wound was self-inflicted.

The SPIN-Score for those in the study ranged from four to 52, with higher scores indicating a greater chance of survival. For this group, 98 percent of those with a score 35 and higher survived while only 3 percent with a score of 20 or less survived. There were no patients in this group with a SPIN-Score of 16 or less who survived.

"More research is needed to validate the SPIN-Score, so for now, it remains a preliminary prediction tool," Muehlschlegel said. "Still, developing this tool is an important step toward improving overall outcomes."

More information: Susanne Muehlschlegel et al. Predicting survival after acute civilian penetrating brain injuries, *Neurology* (2016). DOI: 10.1212/WNL.0000000000003355

Provided by American Academy of Neurology

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