HEALTH The New York Times

Wounds From Military-Style Rifles? ‘A Ghastly Thing to See’

Trauma surgeons tell what it is really like to try to repair such devastating injuries. “Bones are exploded, soft tissue is absolutely destroyed,” one said.

By Gina Kolata and C. J. Chivers

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Left, an X-ray of a leg showing a bullet wound delivered by an assault rifle used in combat. Right, an X-ray of a leg that sustained a bullet wound from a low-energy bullet, inflicted by a weapon like a handgun in Philadelphia. via Dr. Jeremy W. Cannon

Perhaps no one knows the devastating wounds inflicted by assault-style rifles better than the trauma surgeons who struggle to repair them. The doctors say they are haunted by their experiences confronting injuries so dire they struggle to find words to describe them.

At a high school in Parkland, Fla., 17 people were recently killed with just such a weapon — a semiautomatic AR-15. It was legal there for Nikolas Cruz, 19, the suspect in the shooting, to buy a civilian version of the military’s standard rifle, while he would have had to be 21 to buy a less powerful and accurate handgun.

Many factors determine the severity of a wound, including a bullet’s mass, velocity and composition, and where it strikes. The AR-15, like the M4 and M16 rifles issued to American soldiers, shoots lightweight, high-speed bullets that can cause grievous bone and soft tissue wounds, in part by turning sideways, or “yawing,” when they hit a person. Surgeons say the weapons produce the same sort of horrific injuries seen on battlefields.

Civilian owners of military-style weapons can also buy soft-nosed or hollow-point ammunition, often used for hunting, that lacks a full metal jacket and can expand and fragment on impact. Such bullets, which can cause wider wound channels, are proscribed in most military use.

A radiologist at the hospital that treated victims of the Parkland attack wrote in The Atlantic about a surgeon there who “opened a young victim in the operating room and found only shreds of the organ that had been hit.”

What follows are the recollections of five trauma surgeons. Three of them served in the military, and they emphasized that their opinions are their own and do not represent those of the armed forces. One has treated civilian victims of such weapons in American cities. And a pediatric surgeon treated victims of a Texas church shooting last year.

Dr. Jeremy Cannon, the University of Pennsylvania’s Perelman School of Medicine.

He served in Iraq and Afghanistan and is a lieutenant colonel in the Air Force Reserve.

Dr. Jeremy Cannon in the trauma center at Penn Presbyterian Medical Center Advanced Care Pavilion in Philadelphia Mark Makela for The New York Times

“The tissue destruction is almost unimaginable. Bones are exploded, soft tissue is absolutely destroyed. The injuries to the chest or abdomen — it’s like a bomb went off.” If a bullet hits an arm or a leg, he said, the limb often hangs at an unnatural angle. Such victims can need a dozen surgeries over months. “Some eventually decide to undergo an amputation if there is severe pain in the limb and it is dysfunctional,” he said.

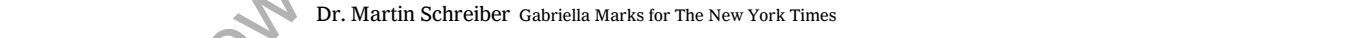
“Bystanders are traumatized just seeing the victims. It’s awful, terrible. It’s just a ghastly thing to see.”

Dr. Cannon recalled the aphorism by José Narosky, the Argentine writer: “In war, there are no unwounded soldiers.”

His corollary: “In mass shootings, there are no unwounded victims.”

Dr. Martin Schreiber, Oregon Health & Science University.

He was an Army reservist who served in Iraq in 2005 and in Afghanistan in 2010 and 2014.



Dr. Martin Schreiber Gabriella Marks for The New York Times

What makes injuries from these rifles so deadly, he said, is that the bullets travel so fast. Those from an M16 or AR-15 can depart the muzzle at a velocity of more than 3,000 feet per second, while bullets from many common handguns move at less than half or a third that speed. The result: “The energy imparted to a human body by a high velocity weapon is exponentially greater” than that from a handgun.

“You will see multiple organs shattered. The exit wounds can be a foot wide.”

“I’ve seen people with entire quadrants of their abdomens destroyed.”

Dr. Jeffrey Kerby, the University of Alabama at Birmingham.

He was formerly an Air Force surgeon. The New York Times

Dr. Jeffrey Kerby Bob Miller for The New York Times

Dr. Kerby will never forget the first victim of a high velocity bullet wound he treated when he was serving in the Southern Philippines 16 years ago. The soldier had been shot in the outer thigh. His first thought was that the wound did not look so bad. There was just a tiny hole where the bullet went in. Then he looked where the bullet had exited. The man’s inner thigh, he said, “was completely blown out.”

Later he came to expect the telltale pattern. “You will typically see a small penetrating wound. Then you roll the patient over and you see a huge exit wound.”

The high energy bullet creates a blast wave around the bullet. And the yaw can contribute to the larger exit wound. Striking bone can also cause bone fragments that radiate outward, cutting tissue in each fragment’s path.

“Then the bullet starts tumbling, causing more and more destruction.” Even a bullet that misses bone can result in surprising damage; as the blast wave travels through the body, it pushes tissues and organs aside in a temporary cavity larger than the bullet itself. They bounce back once the bullet passes. Organs are damaged, blood vessels rip and many victims bleed to death before they reach a hospital. Those who survive long enough are whisked to operating rooms, but often the injuries cannot be repaired.

“If they are shot in the torso, there often is not a whole lot we can do,” he said.

With a handgun, the bullets mostly damage tissues and organs in their direct path. Eventually, the bullets may be slowed and stopped by the body. Emergency surgery often can save handgun victims.

Dr. Kerby said it used to be that surgeons like him saw victims of assault rifle shootings only in the military. No more. Now, though the wounds are still rare on the streets of Birmingham, he operates on occasional victims — that is, those who survive long enough to reach the hospital.

“These weapons are meant to kill people,” he said.

An X-ray of a rifle bullet wound to an arm. via Dr. Jeremy W. Cannon

Dr. Alok Gupta, Beth Israel Deaconess Medical Center in Boston.

Dr. Gupta never served in the military, but he has treated victims of assault-style weapons in New York and Baltimore. Attacks using AR-15-style weapons are still rare, he emphasized. He sees mostly handgun wounds and some from shotguns.

“A single wound from a handgun follows a narrow path, just as much the direct path the bullet took,” Dr. Gupta said. “It is easier to figure out what is injured.” Even a bullet wound to the heart can be repaired, he said, if the patient survives long enough to get to the hospital.

But like other trauma surgeons, Dr. Gupta has been struck by the devastation modern rifle bullets produce. The wide swath of damage makes it difficult to determine the extent of the injuries, and even more difficult to repair them. And if the bullet strikes the heart or other major organ, the victim usually cannot be saved.

“What we hear about in the news are the mass shootings,” Dr. Gupta said.

The victims of military-style weapons that Dr. Gupta has treated in American cities are the silent victims.

Dr. Lillian Liao, University Hospital and UT Health in San Antonio

She operated on children shot in Sutherland Springs, Tex., at the First Baptist Church. Twenty-six churchgoers were killed and 20 others were wounded in a mass shooting carried out with an AR-15 rifle.

Nine of the victims made it to her hospital that day. Four were children, one of whom died.

Dr. Liao was initially clinical in describing the wounds during an interview. “Muscles and skin and fat surrounding skin can be sheared off. We saw holes in intestines and bladders.”

Asked about the emotional impact of the killings, she said she thought she had moved on. Then came the Parkland shootings, and the horror came flooding back.

Lauren Katzenberg and Thomas Gibbons-Neff contributed to this article.

A memorial at the First Baptist Church in Sutherland Springs, Tex., in December.
Ruth Fremson/The New York Times

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Correction: *March 4, 2018*
An earlier version of this article misspelled the given name of the suspect in the Parkland, Fla., school shooting. He is Nikolas Cruz, not Nicolas. The article also misspelled the given name of a doctor at the University of Alabama at Birmingham. He is Jeffrey Kerby, not Jeffery.

Gina Kolata writes about science and medicine. She has twice been a Pulitzer Prize finalist and is the author of six books, including “Mercies in Disguise: A Story of Hope, a Family's Genetic Destiny, and The Science That Saved Them.” @ginakolata . Facebook

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