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Health Science

As the wounded kept coming, hospitals dealt with injuries rarely seen in the U.S.

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LAS VEGAS — As trauma nurse Renae Huening rushed into Sunrise Hospital and Medical Center on Sunday night, she "followed a trail of blood indoors."

Dozens of patients already were crammed into the waiting area, hallways and rooms of the hospital's emergency department. Some were "red-tagged," meaning they needed attention immediately. Names were being assigned randomly because there was no time to register people or find IDs.

Huening could smell the blood.

"The air smells like iron," she recalled Tuesday, barely 24 hours after hundreds of doctors and nurses throughout Las Vegas treated more than 500 victims of the worst mass shooting in modern U.S. history.

"You're standing in a pool of blood trying to care for your patient, slipping and sliding," Huening said. "Soon you're covered in blood yourself."

As investigators fill in the details of Stephen Paddock's rampage during a country music festival along the Las Vegas Strip, doctors, nurses and paramedics are recounting injuries they say are rarely seen in this country. And even the hardest medical professionals acknowledged being rattled.

With Paddock perched on the 32nd floor of the Mandalay Bay Resort and Casino and firing military-style rifles onto the crowd of concertgoers below, the scale and degree of physical damage were extreme.

So many patients poured into the city's hospitals that pediatric surgeons were operating on adults and obstetricians were attending to trauma patients.

Many of the most critically wounded patients arrived at the 541-bed University Medical Center of Southern Nevada, the state's only Level One trauma center. Over about four hours, it received 104 patients. More than 80 percent were gunshot victims.

Douglas R. Fraser, the hospital's chief of trauma surgery, struggled with other doctors there to deal with bullet wounds in torsos and limbs that had shredded human flesh into "unusual patterns," caused "extreme fractures" and bounced through bodies with horrific force.

"These were quite large wounds that we saw," he said Tuesday. "The fractured shrapnel created a different pattern and really injured bone and soft tissue very readily. This was not a normal pattern of injuries."

Gun deaths are this nation's third-leading cause of injury-related fatalities, with the most recent data showing that firearms accounted for more than 36,200 deaths in 2015. Over a nine-year period, according to data from the Centers for Disease Control and Prevention, almost 971,000 people were hurt or killed by firearms in the United States — with a just-released study finding that such injuries cost nearly \$25 billion in hospital emergency and inpatient care from 2006 to 2014.

The devastation that semiautomatic rifles cause to the human body is extreme because they put vastly more energy behind bullets than handguns do.

The velocity of a bullet fired from a typical 9mm handgun is 1,200 feet per second. From an AR-15 semiautomatic, the bullet travels roughly three times faster, and the body must absorb all of that energy.

If a 9mm bullet strikes someone in the liver, for example, that person might suffer a wound perhaps an inch wide, said Ernest E. Moore, a longtime trauma surgeon at Denver Health and editor of the Journal of Trauma and Acute Care Surgery. "But if you're struck in the liver with an AR-15, it would be like dropping a watermelon onto the cement. It just is disintegrated."

Survival generally depends on several factors: the position of the body when it was struck and its distance from the weapon; the velocity of the bullet and the type used; and the location of the entry wound and path the bullet follows before it exits — if it exits at all.

Once inside the body, a high-velocity bullet causes a shock wave as it blasts through tissue. The reverberations expand outward, causing more harm.

"When that happens, it stretches all the blood vessels and tears them, and you lose blood supply to the entire area," said Faran Bokhari, chairman of the Trauma and Burn Unit at Cook County Health and Hospitals System in Chicago, which sees 1,000 gunshot victims a year.

By contrast, even a grievous knife wound damages only the organs and tissues directly in its path.

About half of the victims taken to University Medical Center suffered graze wounds, probably from bullets that ricocheted off the ground, Fraser said. Other patients may have been struck by bullets that passed through other victims. Some were hurt as they tried to flee — or were trampled in the panic.

But 30 were in critical condition after suffering direct hits, he said.

Across the city, hospital administrators called in their entire staffs within minutes of hearing of the shooting and mass casualties. Elite neurosurgeons were mobilized. Environmental technicians were tasked with cleaning up blood.

And the patients just kept coming — by ambulance, in the beds of pickup trucks, in the backs of SUVs.

Of those who arrived at University Medical Center, Fraser believes, doctors were able to revive only one — someone who had been shot in the head.

"A lot of the injuries were gunshots to the chest," Fraser said. He spoke Tuesday as a professional, matter of fact rather than emotional. "Many did not require surgery but required chest tubes to the chest so they could breathe better. The other patients had surgery to remove holes to their bowels and intestines."

For hours, some patients were in danger of suffocating on their own blood. So many wounds resembled those most often seen on battlefields that the hospital quickly contacted four Air Force trauma surgeons who happened to be participating in a visiting-fellow program there.

"They are used to seeing those things," Fraser said.

At one point early Monday, surgeons were conducting five operations simultaneously. "They just came in by the dozens — some of them in a bed, some on a seat — and we just tried to make room for these folks," said Syed Saquib, who was the chief surgeon on duty.

About five miles away at Sunrise Hospital, 214 patients were treated in three hours — nearly the number typically seen in a day.

Scott Scherr, the director of emergency medicine, got to his hospital about 30 minutes after the attack began, breaking "every traffic law in Las Vegas" along the way.

The scene inside stunned him. He remembers blood pouring off gurneys.

"That moment was shocking, but as soon as that moment passed, I knew I had a job to do," Scherr said. He would end up working 20 straight hours.

Hospital staffers gave each patient red or green triage tags identifying the degree of their injuries. When beds filled up, some of the less injured sat on the floor.

Identifying the most critical wasn't always easy. Bullets can tumble as they pierce a body, meaning that even a patient with a small hole in a shoulder could have a tear in a lung or aorta, too.

"They look okay, but they can turn in a heartbeat," said Huening, the trauma nurse.

The surgeries were back to back and seemingly endless. Anesthesiologist Dean Polce was involved in 27 operations. Twenty-six of the patients lived, he said Tuesday, breaking down as he spoke.

"I wish we could have done more," Polce said, lowering his eyes as he choked up. "Where that bullet goes in the body is really hard to guess."

There weren't enough X-ray machines at times, given the volume. Some supplies ran low. At one point, the emergency room ran out of chest tubes, and staff from nearby MountainView Hospital drove over with a pickup truck full of them.

Certified nursing assistant Jacqueline Rodriguez said she can't forget one patient, clearly very scared, who needed a chest tube inserted quickly.

"I saw the look of terror in her eyes. I said, 'Squeeze my hand, scream, do whatever you need to do. It's going to hurt, but years later, you're going to look back at this, and you're going to be alive.'"

Sun reported from Washington. Heather Long and Lynh Bui in Las Vegas contributed to this report.

 **442 Comments**

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