Police guard the Route 91 Harvest Festival in Las Vegas following a mass shooting in 2017. Preventing massacres and other violent acts—a practice known as threat assessment—has become a focus for some in medicine, including Pitt Med's John "Jack" Rozel.

(Photo: Gian Sapienza/Getty Images)

LEFT OF BANG:

PREVENTING A DISEASE CALLED VIOLENCE

BY GAVIN JENKINS

When Raquel Forsythe was a general surgery resident at University Hospital in Newark, N.J., in the late 1990s, she treated a 17-year-old boy who had been shot. He was mixed up in the kind of street violence that was endemic to his neighborhood.

Reading his chart, Forsythe noticed he also had diabetes. She began to talk to the teenager about controlling the disease, but he cut her off. "He looked up at me and said: *Do you really think my diabetes is what's going to get me, Doc*?"

The young man had a point. Approximately 20 percent of homicide victims in this country are people who have already survived violent injuries like a gunshot wound. And African American children in America are about 10 times more likely to be victims of a gun-related homicide than white kids, whether they are directly involved or bystanders to conflicts.

Forsythe took his words to heart. Now medical director of trauma at UPMC Presbyterian and assistant professor of surgery and critical care medicine at the University of Pittsburgh, she believes doctors have an opportunity to intervene and try to break the cycle of violence. "As trauma directors, our role is to say: *Here's a teachable moment. Now, what can we do to change whatever's happening in your social situation that led to this injury? And how can we move forward to keep you safe?"*

If violence were examined like a disease, as recommended by Richard Garland, an assistant professor in Pitt's Graduate School of Public Health and a former gang member, then "whatever's happening," as Forsythe puts it, translates to the symptoms. And Garland can recite those as if they are state capitals: poverty, a lack of education and job opportunities, addiction, mental health issues, and tendencies toward violence within one's narrow network (friends or family within a community).

An activist and mediator in Pittsburgh communities for more than 25 years, Garland has seen how violence takes hold. "A boy grows up poor with his father in jail," he says. "His mom is never home because she's working multiple low-paying jobs. The boys on the corner are always there. So, he quits school, and he gets caught up in drugs and gang life. Follows in his father's footsteps."

Garland, 66, wants to stop the disease from spreading further. He oversees Pitt's Violence Prevention Initiative, which consists of two programs: Homicide Review and Gunshot Recurring Injury Prevention Services (GRIPS).

As gunshot victims recover at one of UPMC's trauma centers, a social worker at the hospital asks if they'd like to meet with Garland and learn about GRIPS. If they say yes, Garland talks to them in the hospital. And after they're released, he might help them find a job and move out of their neighborhood, thanks to donations from the Urban League, Allegheny Link, and the Urban Redevelopment Authority.

"Even if they say they don't want help, I make sure they get my card," Garland says. "A lot of times, they'll call me later on, when they get out of the hospital."

For patients with psychological needs that aren't being met, Garland might help them connect with UPMC resolve Crisis Services (resolve is spelled with a lowercase "r"). The program's 150-member staff (which includes mobile units) offers free crisis counseling and support to people of all ages.

John "Jack" Rozel is medical director at resolve and an associate professor of psychiatry and adjunct professor of law at Pitt. He also recommends cases to Garland and is beginning to build a partnership with UPMC's trauma centers that will be similar to the one GRIPS has.

These partnerships won't always be enough. Garland knows that some aggression can't be stopped. One afternoon, after visiting a gunshot victim in the hospital, he sought out the shooter through his connections and asked whether the situation could be settled peacefully.

"Dude looks at me and says: *Look, you gonna be the one who gives me 300 grand?*" Garland says. "And so he's gonna go after him again, because it's a pride thing. Dude says: *If I don't do nothing to him, I can't make it in this game. Everybody else is gonna be coming at me.*"

Rozel (Res '04, Fel '05) became resolve's medical director in 2010. He and resolve's clinicians focus on being "left of bang." A term that comes from the U.S. Marines, left of bang refers to action prior to a deadly force incident. (Picture a timeline moving from left to right: "Bang," or an attack, is in the middle of the line.)

Emergency medicine professionals like Forsythe typically deal with the right of bang, or the aftermath of violence. But that's beginning to change. Violence prevention has become a focal point within the medical community here and elsewhere in the country, while experts in other disciplines examine how acts of brutality are born and how they spread.

Rozel's work in this field falls under two categories: threat assessment, which is an evaluation of how much risk someone may pose, and threat management, an individualized plan to decrease the risk the person poses.

He says that "most acts of violence stem from a grudge."

His resolve team members intervene in escalating disputes between neighbors, between bosses and employees, between tenants and landlords. And they step in to try to keep everyone safe in domestic disputes. (Our next issue will feature an expanded discussion dedicated to intimate partner violence.)

The resolve team also has helped prevent potential mass shooters from acting. One day, Rozel received a phone call from an outpatient psychiatrist—one of her patients was having homicidal fantasies. The patient, an adolescent boy, had admitted to thinking about shooting people at his school. Then Rozel heard from one of his contacts in law enforcement. The school resource officer had already flagged an

Mourners gather at a vigil on Franklin Ave. in Wilkinsburg, Pa., for mass shooting victims who were ambushed at a party in 2016. The death toll included five adults and an 8-month-old fetus. Richard Garland, of the Graduate School of Public Health, acts as a mediator to try to prevent conflicts from turning deadly. (Photo: John Heller/*Pittsburgh Post-Gazette*)

anonymous online profile of a person who'd been praising the 1999 Columbine High School shooting. After an investigation, they determined that the profile belonged to the boy.

"Everyone's really worried," Rozel says. "But no one is thinking, *This is a kid who needs handcuffs.*"

Through Rozel's coordination, the patient's parents sat down with their son's treatment team, school officials, and law enforcement. After what Rozel describes as a "frank and open conversation," the boy received the treatment he needed and successfully and safely returned to school.

A lot of people assume mass shooters suffer from a mental illness. Yet only about 25 percent of mass shooters have a psychiatric disorder. Rozel says that number is between four and 12 percent when all forms of violence are considered. In Allegheny County between 2001 and 2008, one in six homicide defendants were identified as having a psychiatric issue.

"Of the people with a psychiatric illness who act violently, some of them are absolutely suffering from delusional beliefs. But there's not a clear connection for all of them," Rozel says. "It's more likely than not that they are engaging in violence despite the psychiatric illness, not because of it." They often struggle to interact socially or function physically.

"Most acts of violence stem from a grudge."

While we are discussing misconceptions, Rozel would like to point out that our schools are safer than they seem—they're not where kids are typically killed. In 2019, the CDC reported that 98 percent of incidents involving children killed by firearms occurred outside of schools. Mass shootings in schools are terrifying and heartbreaking, yet still, when it comes to where children die from gun violence, "it's happening in the home and in the community," Rozel says.

He adds that many more high school and elementary school students are becoming traumatized from years of mass shooter drills. He'd like to see schools and communities focus as much on prevention, like recognizing people at risk of violence early on and fostering healthy social environments, as they do on response to violence.

Rozel believes that threat assessment and threat management techniques work as well with a possible mass shooter or gang member as they do with someone who might harm a spouse. People who are close to engaging in a violent act tend to express their intentions, he notes.

"Most people don't just snap," Rozel says. "They usually threaten the person or people they intend to harm directly. Sometimes they tell a lot of people, and those comments often get thrown away. That person thinks: *People are always making threats.* Or: *He didn't really mean anything by it.*"

Listening is the key. Rozel learned that lesson as a freshman at Brown University, when he answered phones at a center with a suicide hotline. In high school, he had worked as an EMT and dreamed of a future in emergency medicine. But, at the hotline, he was astonished by how he could help callers simply by expressing empathy. After medical school at Brown, he moved to Pittsburgh and was mentored by Edward P. Mulvey, an expert on the links between mental illness and violence who directs Pitt's law and psychiatry program.

"Here I am now, over 25 years later, and listening is always the most important part of my job," Rozel says.

Political violence from extremists can start with a grudge, as well. Violent radical actors—white supremacists or Islamic extremists, for example—tend to be upset over what they see as injustice, and they want to respond to those perceived slights by creating what they believe to be a better society. When met with resistance, particularly any form of repression from a government, an extremist might escalate to violence.

"If they're already engaging in violence, they increase the level of that violence," says Michael Kenney, program director of international affairs at the Graduate School of Public and International Affairs (GSPIA), who examined al-Muhajiroun (which translates to the Emigrants) in *The Islamic State in Britain: Radicalization and Resilience in an Activist Network*.

"So, there's a classic action, repression, escalation, and violence dynamic," he says.

Kenney says that for most Muhajiroun he interviewed, Islamic extremism was a phase. The group spreads its ideology by attracting young men and women who want to rebel against their families and replace Western society with a caliphate. Many al-Muhajiroun work regular jobs while they are involved with the group. Eventually life—the desire to get ahead at work, start a family—tends to get in the way of starting a revolution. They leave the extremist group to lead normal lives.

White supremacist networks, like other radical groups, attract new followers online, but they usually do it by claiming to have secret knowledge of a plot to harm white people, according to Kathleen Blee, the Bettye J. and Ralph E. Bailey Dean of the Kenneth P. Dietrich School of Arts and Sciences and the College of General Studies. Blee examined white supremacy in her 2017 book, *Understanding Racist Activism: Theory, Methods, and Research*.

Blee says that the plot often revolves around a fabricated threat that is imminent, and that urgency usually drives people to act violently.

White supremacist violence can spread through a contagion effect, according to Kenney. When a white supremacist commits a mass shooting, the shooter sometimes leaves a manifesto behind, and his words may inspire others. They may leave manifestos, as well, inspiring more acts.

"We have to be careful that we don't help glorify the perpetrators," Kenney says. "Because that contributes to the contagion effect. I do think the media has gotten smarter about not naming perpetrators or showing their image over time."

Extremist networks have expanded enormously through social media.

Blee notes that tech companies like YouTube have attempted to confront the spread of terrorism, specifically white supremacy, but they still have a long way to go.

"With YouTube, you're just redirected down an abyss of white supremacy very quickly," Blee says. "That means that people who aren't really searching for that topic get started on the process. They get pulled into these sites. Not just sites, communities."

What do we know about the biology of violence?

In 1949, Walter Hess won the Nobel Prize in Physiology or Medicine for using deep brain stimulation in animals to evoke behavior. Hess triggered aggression in cats by releasing weak electrical currents to different parts of the hypothalamus—a small region near the base of the brain that releases hormones and regulates body temperature.

"There's been evidence for a long time that the basic circuits for attack and rage, the underlying elements of violence, are kind of built into the brain, hardwired," says Peter Strick, Distinguished Professor and chair of neurobiology at Pitt. "What we have above those basic circuits, are in a sense, the cognitive control circuits and emotional control circuits that modulate how we engage those very basic motor and behavioral programs."

To understand how the basic circuits become more easily triggered in some people, Strick points to Harry Harlow's classic study of monkeys. In the 1930s at the University of Wisconsin-Madison, Harlow separated infant monkeys from their mothers at birth and isolated them. When the monkeys became sexually mature, they attacked their cagemates and their human handlers. These were cagemates and handlers who had been friendly with the monkeys for years. The monkeys who had spent time with their mothers did not show the same unprovoked aggression.

This study may not translate directly to humans, in terms of maternal separation, but: "There's something about an early adverse life experience, when the brain is developing, that can lead to—particularly in these isolated monkeys—unprovoked aggression," Strick says.

Brain development can be stunted a number of ways—poor nutrition, living in poverty, and physical and emotional abuse are some of the most common culprits.

Strick says that when a child is harmed by factors like these, it can lead to depression, addiction, and violence as an adult.

"That's why the developing brain is a brain at risk," he says.

The average bullet travels 2,500 feet per second, roughly 1,700 miles per hour. Bullet cases—the cylinder that holds the ammunition—are made of copper, steel, or brass. When these projectiles hit the human body, they don't cut a clean path through tissue like a knife would.

Forsythe knows this all too well.

"I am, unfortunately, an expert on gun violence," she says.

A bullet possesses energy, which causes injury outside the path it travels. It creates a

temporary cavity as it passes through tissue, and there is a ripple effect of damage. If a bullet from a 9-millimeter handgun pierces a human liver, it creates a hole that disrupts an area that is three-quarters of an inch wide. A bullet from a rifle damages everything within 3 to 4 inches around the cavity's path. If it strikes the liver, the organ is likely destroyed.

"A bullet can splinter bones and wreak havoc on the human body that lasts for years, if not for the rest of a person's life—if they survive," Forsythe says.

If someone managed to live after being shot in the lower intestines, they might have to wear a colostomy bag for life. If a bullet lodged in someone's spine, they might suffer from quadriplegia or paraplegia. When children are hit on a growth plate, they could end up with arms of different lengths.

On the morning of Dec. 14, 2012, Forsythe was seeing patients in UPMC Presbyterian's intensive care unit. While on rounds, a nurse informed her of the breaking news: A gunman had just murdered 27 people, including 20 children between the ages of 6 and 7 at Sandy Hook Elementary School in Newtown, Conn.

Forsythe felt an urge to take her oldest daughter, then in first grade, out of school. She wanted to drive her home and hug her tightly.

In the coming hours, as Forsythe continued to treat patients, she couldn't help but picture the crime scene inside Sandy Hook Elementary.

She also imagined the trauma surgeons at hospitals in Connecticut waiting for wounded children who never arrived. She became filled with frustration, and that led to a realization: Waiting at the hospital isn't enough; doctors have to do "whatever we can to get more people to the trauma center alive, so that we can try to do our jobs."

Forsythe wasn't the only doctor who came to this conclusion that day. A few months after the massacre, Lenworth Jacobs Jr., then a surgeon at Connecticut Children's Medical Center and regent with the American College of Surgeons, assembled experts from government and the medical and security communities to draw up the Hartford Consensus, a set of national guidelines to help people survive mass shooting events. From those guidelines, Stop the Bleed was born.

Stop the Bleed is a national campaign that focuses on teaching people how to perform emergency medicine tactics, such as how to pack a wound and apply a tourniquet.

In 2016, Forsythe joined a UPMC steering committee to implement a Stop the Bleed program in Western Pennsylvania. In three years, more than 50,000 people in the Pittsburgh region have been trained on how to perform these life-saving tactics. On Oct. 27, 2018, police officers and EMS used their Stop the Bleed training to save the lives of SWAT team officers and worshippers at Tree of Life.

Forsythe wants kits of tourniquets and packing gauze to be as readily available as defibrillators. But she knows that's not enough to save everyone caught in the crossfire of a mass shooter. Or to save women attempting to escape violent partners. Or inner-city kids from becoming collateral damage.

She wants to do more that's left of bang. So she and Rozel have testified at Pennsylvania House meetings and Senate Judiciary hearings to clarify the intersection of mental health and aggression and discuss gun violence as a public health issue. They are partnering with legislators and others—Rozel is working with gun shop owners—to address gun violence in less polarizing ways.

Only about 25 percent of mass shooters have a psychiatric disorder. That number is between four and 12 percent when all forms of violence are considered.

As a teenager in Philadelphia, Garland joined a gang and spent a combined 23 and a half years in prison. His last stint (at 12 and a half years) was for conspiracy to commit murder.

While in prison, he earned his GED. After he was released, he moved to Pittsburgh and got a job at the Addison Terrace Learning Center talking with troubled teenagers about drug and alcohol issues. The experience inspired him to get his bachelor's degree ('92) and then a master's degree in social work ('96) from Pitt. Today, he's a member of Chancellor Patrick Gallagher's public safety advisory board; he works with nonprofit organizations and gives talks to law enforcement groups, as well as teenagers who are at risk of getting caught up in street violence.

"I'd like to think I wouldn't have joined a gang if GRIPS or resolve had been around [when I was younger]," Garland says. "But I don't know. I was all about gang life back then."

Garland admits he's one of the lucky ones.

A close friend has been in prison for 51 years. Others Garland associated with in Philadelphia moved out of the city to escape gang life. Everyone else he knew from that crowd is dead.

Forsythe has so much experience informing family members that their loved one has died from gunshot wounds that she has a routine. First, she silences her pager and phone so that she's not disturbed while talking to the family. She checks her scrubs and shoes to make sure there's no blood on them. She takes the family to a quiet room, introduces herself, and then warns them she has bad news.

"It's important to use the word 'died.' It's clearer," Forsythe says.

"Some people get very quiet and internalize everything. Some people fall on the floor and cry and scream.

"You have to let people respond, and be silent—which is very hard because you want to jump in, and you want to comfort and soothe." ■