

Subway Trauma: Two NYU Studies Examine Subway Injuries *NYU Research*, Spring 2006

For many of the 7 million passengers who ride New York City's subway system daily, the intense dread of ending up on the tracks can be hard to shake. Until recently, no public record has been available to address those fears. Over the past several months, however, New York University School of Medicine physicians published two studies that provide rare insight into subway injuries: exploring who is at risk, what happens in the aftermath, and how such accidents can be prevented.

Both studies were conducted at Bellevue Hospital Center, a level 1 trauma center that serves as the regional limb-replantation center for New York City. Their team of trauma, orthopaedic, vascular, and plastic surgeons treat subway accident patients round-the-clock. "By protocol, every ambulance in all five boroughs has to bring us victims of traumatic amputations," said Maurizio A. Miglietta, D.O., F.A.C.O.S., Chief of Trauma & Critical Care at NYU and Director of Trauma Surgery at Bellevue Hospital.

In the January 2006 issue of *The American Surgeon*, Dr. Miglietta and his colleagues looked back at 41 patients who had been treated for subway-related amputations—resulting in the loss of one or more arms or legs—from 1989 from 2003. Using the Bellevue Hospital Trauma Registry, the researchers unearthed a number of details. For example, only 14 percent of patients had been using illicit drugs before their injuries, while 39 percent had elevated blood alcohol levels. Seventeen percent had been diagnosed with prior psychiatric illnesses. For 27 patients, the cause of the accident could be identified: 14 fell, five were pushed, five attempted suicide, and three fell while experiencing seizures. Most of the injuries occurred between 6 p.m. and midnight.

The group was 79 percent male, with an average age of 37. "The scary part is that most of these people are just young men in their thirties, the population that's most fit and alert," said Dr. Miglietta. "Maybe they are the people on their cell phones. Maybe they're the ones using their Blackberries, young business-type people who are just distracted."

Even while sustaining such devastating injuries, the patients were quite resilient. "Most of them come in with stable vital signs. The body is incredible at sealing off blood vessels when they're cut sharply by the train's wheels. It's like a big 80,000-pound knife," he explained. Only two patients died. But while the trauma team tried to reattach limbs for eight patients, none of the attempts succeeded.

Wound infection was also a concern, affecting 32 percent of patients. These results have already affected Dr. Miglietta's treatment approach. Now instead of closing wounds early and sealing them, he washes them out multiple times before closing them in order to minimize infection.

Another NYU study, published in the *American Journal of Public Health*, looked at a

wider spectrum of subway injuries. By analyzing the records of 208 patients treated at Bellevue from 1990 to 2003, researchers found that many people escaped surprisingly unscathed. “The majority of patients had more minor injuries, like bruises or scratches, or they lost a finger or a toe,” said Amber A. Guth, M.D., Associate Professor of Surgery at NYU and primary author of the article. During the study, she served as Surgical Director of Bellevue’s Intensive Care Unit. “About half the patients went home right away.”

Dr. Guth and her fellow researchers also examined whether there was a pattern to subway injuries. “We were curious to see if they related to any societal changes, because people who are injured are often very marginal people, with fewer economic resources and a lot of psychiatric issues,” she explained. During the years of 2000 to 2003, 25 of 56 injured patients were unemployed. Over the entire thirteen-year study, when results were paired with unemployment rates, a pattern emerged. At times when the economy weakened, subway injuries did appear to increase.

Both studies also proposed measures to prevent subway accidents. One answer, suggested Dr. Guth, is simple—slow down. If trains enter the station at reduced speeds, motormen would have more time to notice people on the tracks and stop before impact. Dr. Miglietta hopes to investigate whether lights flashing along the tracks, much like those in the Washington, D.C., subway system, are effective in reminding people to step back before a train arrives. Law enforcement officers and subway staff can also be alert to people who appear physically impaired or whose behavior suggests they are considering a suicide attempt, especially during dips in the economy.—Caitlin E. Cox