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Risk Factors for Suicide Completion Identified in Cohort of Suicide Attempts

Red Flags May Offer Opportunities for Intervention

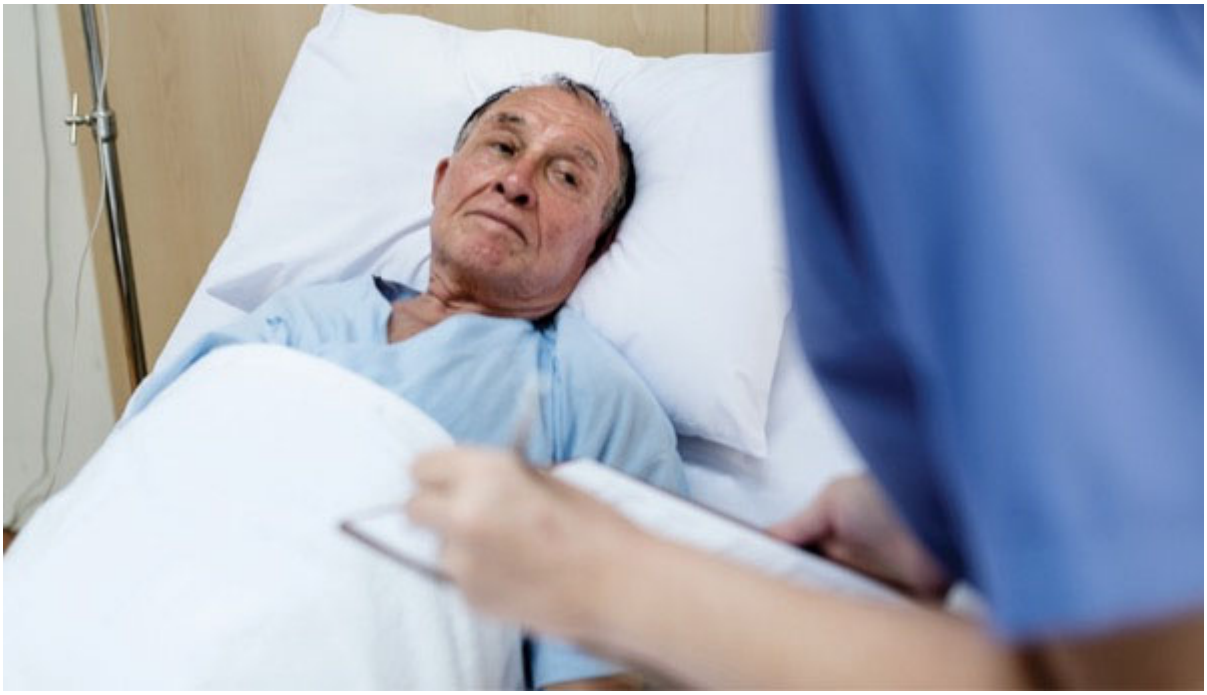
By Monica J. Smith

SAVANNAH, Ga.—In patients who present to the emergency department after an attempted suicide, a handful of factors may alert physicians to that patient's risk for suicide completion in the future, presenting an opportunity to intervene at discharge, according to new research.

Suicide has long been a public health problem in the United States. In 2022, death by suicide claimed the lives of more than 45,000 people, representing one death every 11 minutes, and the suicide rate has only continued to increase, said Terhas Weldeslase, MD, a general surgery resident and research fellow at Howard University Hospital and College of Medicine, in Washington, D.C.

"So, it's important to understand the risk factors associated with suicide and mortality so that we can work to prevent such deaths," she said.

To identify predictors of death among patients who present to the ED after attempted suicide, Dr. Weldeslase and her colleagues conducted a retrospective review using data from the National Emergency Department Sample database from 2010 to 2017, looking at mortality either in the ED or within 30 days of admission for attempted suicide, using ICD codes to identify attempts and mechanisms of self-inflicted injury.



In addition to mechanisms of injury, they looked at age, sex, income, insurance, geography and predictors of suicide—such as mental health, chronic injuries and social risk factors—to determine predictors of completed suicide.

They identified 979,383 ED visits for attempted suicide, among whom 10,301 died either in the ED or after admission. The greatest proportion of attempts was among younger people, with a median age of 30 years, while the greatest proportion of completed suicide was among those with a median age of 43. Female patients dominated suicide attempts, at 57%, while male patients made up the largest proportion of completed suicides, at 74%.

The most common mechanism of injury was poisoning, at 59%, while the most lethal method was self-inflected gunshot, which accounted for about 40% of deaths, followed by suffocation, which accounted for 25% of completed suicides.

After their multivariate and logistic regression analysis, Dr. Weldeslase and her colleagues identified a number of factors that predicted risk for completed suicide, first of which was increasing age, with the highest risk being among those over the age of 65. Other risk factors included male sex, residence in the northeastern United States, uninsured status and higher rates of income, which had a dose–response effect: The rates of mortality went up consistently with progressing median income.

“This is consistent with studies that show higher earning individuals have a higher risk of suicide,” Dr. Weldeslase said.

She acknowledged an important limitation of the study: It does not account for completed suicide cases that never made it to the ED.

Michael C. Smith, MD, an assistant professor of surgery at Vanderbilt University Medical Center, in Nashville, Tenn., said the study was timely.

“New numbers by the Centers for Disease Control and Prevention show that the number of people dying by suicide is now up to 48,000; as well, 12.2 million people think about suicide, 3.2 million plan suicide and 1.2 million attempt suicide in our most recent numbers. It’s the second-leading cause of mortality in ages 10 to 34 and 12th overall in the United States, and it’s increasingly a burden to people of color and the LGBT community. So, it’s really important that this work is being done,” Dr. Smith said.

Dr. Smith had a couple of questions. First, as noted, the study focuses on patients with a survival bias that got them at least as far as the ED. “How do you plan to account for patients who are pronounced in the field and never transported?”

Factors that predicted risk for completed suicide:

- **increasing age (highest risk being among those over the age of 65)**
- **male sex**
- **residence in the northeastern U.S.**
- **uninsured status**

- **higher rates of income (rates of mortality went up consistently with progressing median income)**

Dr. Weldeslase said she and her colleagues tried to make their samples as representative of the general population as possible by using the national ED database and applying a logistic regression analysis to account for all factors that could potentially influence the association between the factors and outcome of death by suicide.

“So those risk factors we identified to have a statistically significant association with mortality could potentially be applied to the general population, including those who are announced on the scene,” she said.

Second, Dr. Smith asked how this information can be used. “What can we do, as a society, as trauma surgeons, as public health officials, to try and help this problem?”

One strategy the authors identified from the study was to make the most of the ED discharge, Dr. Weldeslase said. “The ED discharge gives us an opportunity to help assure patients with higher risk have access to mental health care and support. Interventions designed in this setting could potentially mitigate morbidity and mortality associated with suicide attempts.”

Noting the finding that suicide risk increases with higher income status, she also pointed out that suicide risk is higher in people with demanding jobs, like physicians. “The change can start in our own house, the house of surgery. We can provide means to decrease burnout and increase satisfaction in our field, create an environment where residents can thrive, and implement strategies for physicians who attempt suicide as well as those who have suicidal ideation [to support them] at their workplace,” Dr. Weldeslase said.