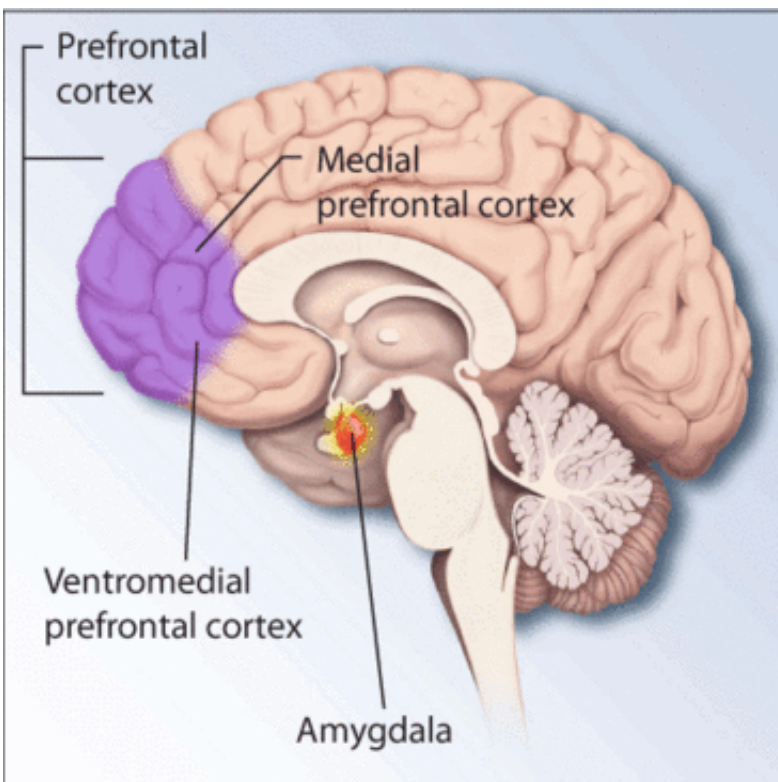


Risk patterns identified that make people more vulnerable to PTSD

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Regions of the brain associated with stress and posttraumatic stress disorder.
Credit: National Institutes of Health

Researchers have built a new computational tool that identifies 800 different ways people are at increased risk for post-traumatic stress disorder (PTSD), permitting for the first time a personalized prediction guide.

Results from the study out of NYU Langone Medical Center are published online (date) in the journal *BMC Psychiatry*.

"Our study shows that high-risk individuals who have experienced a traumatic event can be identified less than two weeks after they are first seen in the emergency department," says Arieh Y. Shalev, MD, the Barbara Wilson Professor in the Department of Psychiatry at NYU Langone and a co-director of NYU's Steven and Alexandra Cohen Veterans Center. "Until now, we have not had a tool - in this case a computational algorithm—that can weigh the many different ways in which trauma occurs to individuals and provides a personalized risk estimate."

Presently, all that clinicians have had to work with are computation methods capable of calculating the average risk for entire groups of survivors—and those have proven to be insufficient as an individual risk prediction tool. The new algorithm applied risk prediction tools currently used to predict the growth of cancer, to predicting PTSD.

The study set out to uncover interchangeable, maximally predictive sets of early risk indicators and build a Target Information Equivalence Algorithm, previously developed at the NYU Center for Health Bioinformatics for molecular and cancer research. The algorithm showed that, when applied to data collected within ten days of a traumatic event, it can more accurately predict who is likely to develop PTSD despite the many ways in which [traumatic events](#) occur. Data crunched into the algorithm includes variables on type of event, early symptoms, and emergency department findings.

"Until recently, we mainly used early symptoms to predict PTSD, and it had its drawbacks," Dr. Shalev. "This study extends our ability to predict effectively. For example, it shows that features like the occurrence of head trauma, duration of stay in the [emergency department](#), or survivors'

expressing a need for help, can be integrated into a predictive tool and improve the prediction."

Devising a strong predictive model also is imperative for tailoring prevention efforts for people at risk for developing PTSD, Dr. Shalev adds.

Dr. Shalev's latest study builds on data originally gathered from the Jerusalem Trauma Outreach and Prevention Study, which he and colleagues conducted at Hadassah Hospital in Israel and which previously was published in *Archives of General Psychiatry*. That study concluded that two forms of cognitive behavioral therapy, prolonged exposure and cognitive therapy, were equally effective in preventing PTSD in recent survivors.

Dr. Shalev was careful to stress that this latest publication is a "proof of concept" paper. For robust prediction across conditions, he says, the identified algorithm needs to be used to gather knowledge gained in traumatic events experienced by other patient populations and traumatic events - beyond those analyzed from the earlier study.

To build a generalized predictive model, the research team, in collaboration with researchers from Columbia and Harvard University, has already received datasets from 19 other centers worldwide in an NIMH-funded study designed to produce a comprehensive predictive algorithm.

"In the future, we hope that we will be better able to tailor treatment approaches based on more personalized risk assessment," Dr. Shalev says. "PTSD exacts a heavy toll on affected individuals and society."

According to large epidemiological studies in the US and through the World Health Organization, the majority of living adults will experience

at least one traumatic event during their lifetime, and five to ten percent of those exposed to traumatic events may develop PTSD.

Provided by New York University School of Medicine

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