

Startup enabling precision medicine for mental health, pain

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This is Alexander B. Niculescu. Credit: Indiana University

A new startup company founded on science developed at Indiana University is working to enable precision medicine by commercializing the first objective tests for mental health issues, including suicide risk, post-traumatic stress disorder and depression, and for pain, all of which historically have been difficult to measure for patients and health care providers alike. These tests will also help match patients to the right medications.

"There is no objective method to assess pain in current clinical practice," said R. Matthew Neff, co-founder, president and CEO of MindX Sciences. "A doctor shows you a happy-to-sad face scale and asks you to rate your pain, and then they observe you. That's it. They can't tell the magnitude of the pain because it's a very personal, subjective experience."

According to a 2016 report by the Centers for Disease Control and Prevention, an estimated 20.4 percent of American adults—about 66 million people—suffer from chronic pain.

But without an objective way to measure how badly a patient is suffering, it's difficult for [health care providers](#) to know how to treat their condition or measure the effectiveness of that treatment regimen over time, Neff said.

"This uncertainty is part of the reason why the opioid epidemic came into being," he said.

That's why MindX Sciences, which is based in Indianapolis, is developing apps and blood tests that will help doctors objectively assess the severity of pain and several [mental health issues](#), including suicide risk, PTSD and depression, as well as determine a patient's risk for future clinical problems. Its products will also help doctors match patients to specific medications and monitor their response to treatment. Neff said the tests could help [pharmaceutical companies](#) develop new medications, including some promising compounds that MindX has already identified.

The company's work is based on more than 15 years of research by IU School of Medicine professor of psychiatry Alexander B. Niculescu, who has identified blood biomarkers for suicide risk, depression, pain, longevity, PTSD and other indications. Niculescu is the founder, chairman and chief scientific officer of MindX Sciences, which is licensing his intellectual property from the IU Innovation and Commercialization Office.

Niculescu, who is also a practicing psychiatrist, said he started MindX because he wants to help doctors do a better job of saving and improving lives.

"Suicide is a growing epidemic, and so are pain and opioids," Niculescu said. "PTSD is underdiagnosed and undertreated in both civilian and military populations. One in four people will suffer from depression in their lifetime. Mental health can directly influence aging and longevity. These are all targets we want to sequentially address, and we have put together a first-class team to do that. It's

very important to bring psychiatry into the 21st century—to make it on par with other medical specialties—because in the end, everything we are or do is reflected in the mind. If your mind is helped to function well, your whole life is happier and longer."

For other diseases, like cancer, physicians can biopsy the affected part of the body to determine its stage of disease, Niculescu said. But when it comes to mental health and pain, he said, biopsying the brain isn't an option, so the company has engineered new "liquid biopsies" that will allow doctors to track mental health symptoms objectively using blood.

"A very important part of this whole process is matching people with the right treatments, in a personalized way," Niculescu said. "It's important that we're able to track how well the treatments are working and to adjust course if necessary."

Neff said MindX Sciences expects to have its first blood tests for pain and [suicide risk](#) available to doctors within the next year through an early-access program. Additional wider access and blood tests for other indications will become available over the next one to three years, he said.

"What this means is not only will doctors be able to confirm when the patient is telling them something is causing [pain](#) or mental distress, they will know the risk of future clinical worsening even before that," Neff said. "Doctors will also have actionable information about what medications and nutraceuticals they can put patients on and be able to track how they are responding to treatment."

This innovative work reflects IU's extensive expertise and research curing, treating and preventing chronic illnesses. To build on the intersection of these areas of core strength and to bring [precision medicine](#) treatments to Hoosiers, IU President Michael A. McRobbie in June 2016 announced IU's inaugural Grand Challenge, the Precision Health Initiative.

Provided by Indiana University

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