Accidental discovery should help aneurysm patients

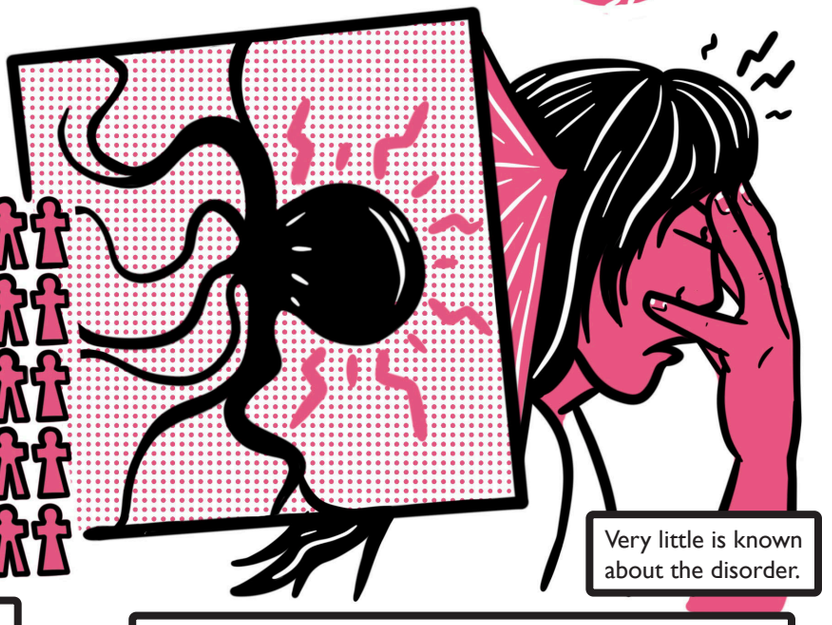
IDEAS to REALITY



Written by Katy Rank Lev • Drawn by Maggie Lynn Negrete

Up to 5% of the U.S. population suffers from brain (cerebral) aneurysms. Women are nearly twice as likely to have one. When these bulging blood vessels burst, it's deadly–up to half of these patients do not even make it to the hospital for surgery. Of the ones who do, two-thirds are left with lifelong, profound disabilities.





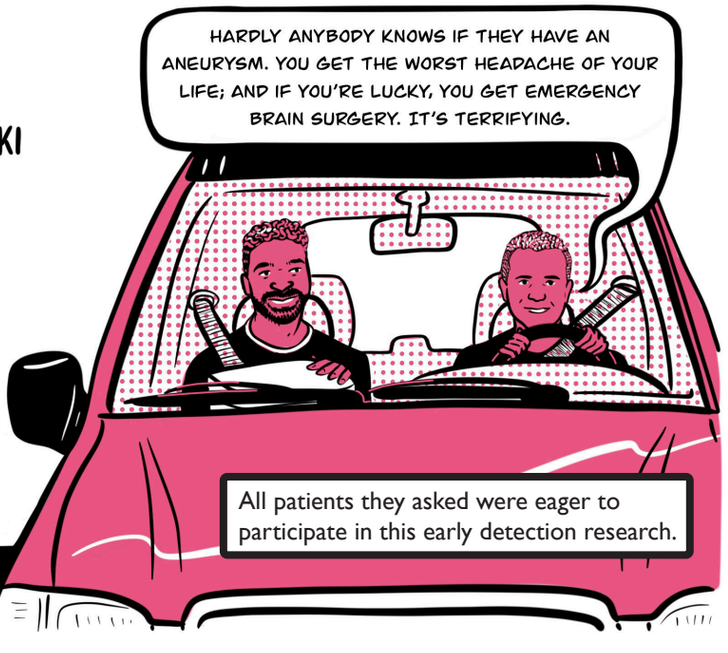
Very little is known about the disorder.

Currently, brain surgery is the only available treatment for aneurysm, and detection is complicated. In 2019, University of Pittsburgh medical student Aditya Mittal and UPMC neurological surgery resident Kamil Nowicki, an MD, PhD, were researching potential aneurysm medications with Robert Friedlander, MD Distinguished Professor and chair of neurological surgery.

Once the pair realized aneurysms leave fingerprints in the blood, they rushed to get Institutional Review Board approval to collect more samples from Pittsburgh hospitals treating aneurysm patients surgically.

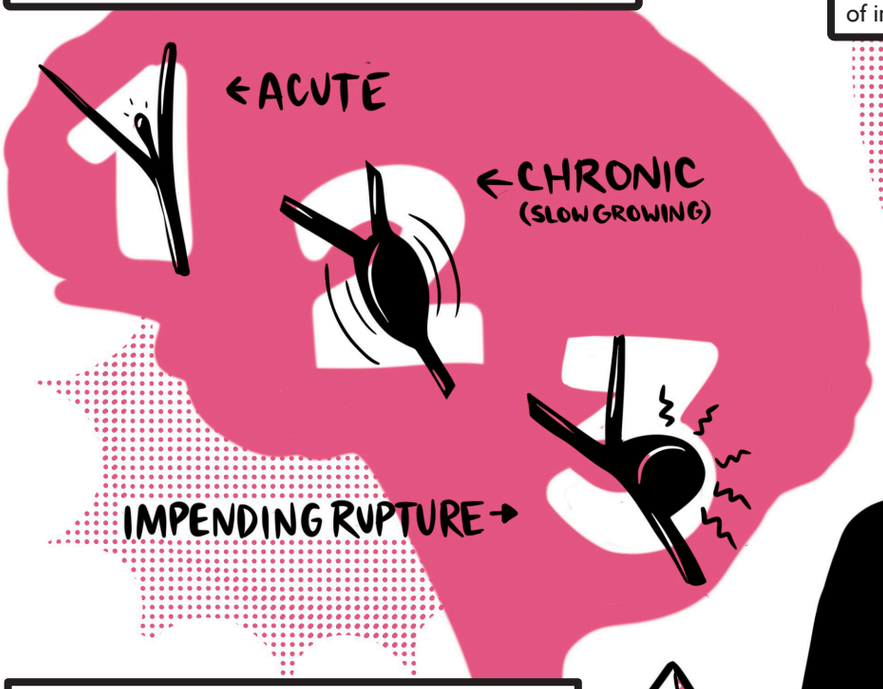


They realized some samples had different inflammatory markers.



All patients they asked were eager to participate in this early detection research.

Nowicki and Mittal realized they could not only identify the presence of an aneurysm in the blood samples, but they could classify the severity of the problem. With guidance from Michael McDowell (Res '21, Fel '22), an MD assistant professor of neurological surgery, they identified three fingerprints, each indicating a phase of inflammation.



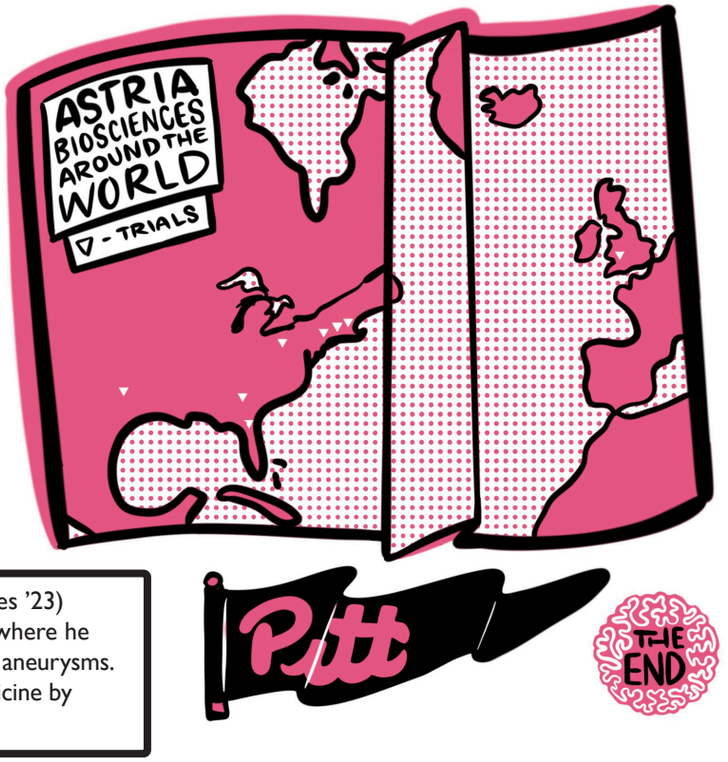
Mittal and Nowicki each took a year off from their studies and training to develop a test, named CAT-7, that they hope becomes routine. Their work included conversations with aneurysm patients and their families, who described "ticking time bombs" lurking in their blood. Aneurysms tend to run in families, who live in fear of invasive surgery, impaired lifestyle and sudden death.



Their test received support from entrepreneurial competitions and took first place at the National Inventors Hall of Fame's 2023 Collegiate Inventors Competition. Under Friedlander's supervision, CAT-7 also nabbed a 2023 National Science Foundation Small Business Innovation Research Phase I award.

Astria Biosciences–a startup founded by Nowicki and Mittal–is setting up a multisite clinical trial throughout the United States and United Kingdom. They aim to apply for FDA approval for CAT-7 in 2026.





Mittal is now a fourth-year medical student. Nowicki (Res '23) just finished an endovascular surgical fellowship at Yale, where he estimates one-third of his cases were related to cerebral aneurysms. Both men hope CAT-7 will transform neurovascular medicine by reducing the need for emergency aneurysm surgery.

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