ARTIFICIAL INTELLIGENCE | SAVES VALUABLE TIME IN TREATING STROKE PATIENTS

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Artificial intelligence (AI) has become part of our daily lives. As technology advances make it possible for machines to process large amounts of data, identify patterns, learn from experiences, adjust, and perform more human-like tasks, the impact of AI is becoming more profound. Nowhere is that more apparent than in health care.

For Enya, a 33-year-old police officer who suffered a stroke last August, artificial intelligence technology from Viz.AI implemented at University of Utah Health and Davis Hospital may have been the difference between life and death.

To understand why AI represents such a big step in treating stroke patients, it's first important to understand what happens during a stroke. Enya suffered a large vessel occlusion (LVO) that led to an ischemic stroke. That means a large blood clot entered an artery in her brain and got stuck, blocking critical blood flow to brain tissues. Blood supplies the brain with vital oxygen and nutrients. With every passing minute that blood, oxygen, and nutrients were not flowing to her brain, about two million of Enya's neurons were dying.

> **"Tissues in the brain do not regenerate," says Ramesh Grandhi, MD, a University of Utah Health neurosurgeon and the doctor who performed Enya's surgery. "Once neurons die, your brain can try to compensate, but it cannot regrow what was lost."**

That's why it is so important to recognize that a patient is having a stroke and call for help—campaigns like the **F.A.S.T. method** have helped with that—so doctors can understand exactly what kind of stroke the patient is experiencing and begin the correct treatment.

Treatment for ischemic strokes works well, but there are inherent delays in the conventional workflow. Before this technology, a patient arriving at Davis Hospital with signs of a stroke was taken for a CT angiogram (CTA), performed by a technician, who then sends the scan to a radiologist to diagnose and locate the clot. The radiologist, upon discovering the clot, is responsible for notifying the ER doctor, who then calls an interventional neurosurgeon to perform an emergency thrombectomy (a procedure to pull the clot out of the artery using a wire and catheter). Though everyone involved knows the importance of each passing minute for the patient and works as quickly as possible, delays are inevitable with this linear step-by-step process.

Enya's stroke occurred early in the morning. Her husband called 911 and Layton Fire Department quickly got her to the hospital for a CTA scan. With Viz. AI technology, the scan was immediately pushed into a cloud-based software system, where an artificial

intelligence algorithm processed and analyzed it. The AI program identified the LVO in Enya's brain and immediately sent a notification through a smartphone app to the University of Utah Health neurosurgeon on call.

Around 6 am, Grandhi saw the notification. Within minutes, he was on his way to the hospital, coordinating with emergency room doctors on the way.

> **"This technology doesn't replace radiologists, but it turns a linear process into a parallel process," Grandhi says. "It cuts down on delays because everyone is working with the same information at the same time. This technology is the perfect complement to treatment protocols we already have in place to speed up stroke care."**

This is particularly important when surgeons from University of Utah Health expand care into community hospitals. At a university hospital, there is continuous coverage, 24 hours a day and 365 days a year, with radiologists available to read CTA scans, neurologists on site to see stroke patients and neurointerventional surgeons available to perform emergency thrombectomy procedures. But that's not always the case at smaller community hospitals.

Reducing delays meant Enya was able to get cutting-edge care as quickly as possible. She underwent a thrombectomy soon after Grandhi arrived at Davis Hospital. Saving those valuable minutes could have meant the difference between a full recovery and more lasting damage following the stroke.

Enya was in the ICU for a few days while doctors figured out what caused the clot and determined whether she was at risk for another one. Never one to sit around long, though, Enya went back to work at the police station a week later. She was soon running and working out, two things she was passionate about before the stroke and continues to enjoy today.

Enya (center), Ramesh Grandhi, MD (neurosurgeon), and members of Layton City Fire Department.

She also recognizes how lucky she was. "I nearly died that day," she says. "I thank God, my husband, the first responders, and the doctors who saved my life."

Enya's treatment and recovery is a testament to the importance of staying on the cutting edge of technological advancements that enhance patient care. "One of the most exciting things about this technology is the continuous improvement," Grandhi says. The algorithms are always advancing and learning, so they get better at detecting LVOs every day. In addition, the company is working on ways to detect other dangerous conditions like brain hemorrhages in the future.

"The mission of any hospital and physician is to provide excellent care to our patients," Grandhi says. "It's very important for physicians and health systems such as University of Utah Health, an academic medical center, to be aware of technologies that help us toward that end. This is a really good tool for us to help patients in the community."

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