Drones could move time-critical blood samples across Missouri for organ transplants

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A St. Louis-based organ transplant agency is exploring unmanned drones as a faster, cheaper method of moving blood samples and medical

supplies across the Midwest.

Leaders at Mid-America Transplant, the region's coordinator for organ and tissue donations, said their first goal is to create a system to transport blood samples from potential organ donors to confirm eligibility, via drone. But they also want to eventually use the devices to move medications and supplies to and from rural areas.

And one day, they may follow in the footsteps of other North American medical centers, and explore the potential use of drones to transport donated organs.

Kevin Lee, the president and CEO of Mid-America Transplant, said that when his agency determines whether a patient is eligible to become an organ donor, a blood sample is taken to a lab in St. Louis. If the patient is outside of the St. Louis area, it's "an incredibly resource-intensive process," Lee said.

It's a time-sensitive and expensive effort, orchestrated multiple times each week across a network of cars and small planes. The sample is usually transported by a turboprop plane to the Spirit of St. Louis Airport in Chesterfield and driven the rest of the way.

Retrieving a blood sample from Springfield—home to some of the largest hospitals in southwest Missouri—is about a 3-hour operation, and costs between $9,000 and $12,000.

"It's pretty significant for an organization of our size," Lee said.

A drone flight over the same distance would take closer to two hours, Lee said.

Mid-America also wants to eventually use drones to move medications

and test samples between the region's major hospitals and the far-flung corners of the Midwest where medical services are thin. And perhaps, even farther in the future, their efforts could lead to a more efficient means of transporting organs for transplant.

The technology has been explored in other parts of the U.S. and around the world, with some early successes. In Rwanda, health officials routinely use drones to transport blood, cutting delivery times over impassable mountains and remote roads from four hours to 15 minutes in some cases, according to the World Health Organization. Medical centers in Baltimore and Toronto have successfully transported donor organs by drone.

Lee's agency is now working with Dallas-based Valkyrie UAS Solutions, a company that has been testing such drone flights in Texas and Oklahoma. Valkyrie officials said they have more work to do to determine the final cost for a comparable drone flight. But they think it will be in the range of $100 to $1,000.

"We're working on some very rough numbers," said Ty Harmon, chief strategy officer of Valkyrie UAS Solutions.

In order to establish a route between St. Louis and Springfield, the companies would have to secure approval from the Federal Aviation Administration and run a series of test flights. Mid-America's Lee said he would ideally like to begin transporting blood samples in the next 18 to 24 months.

The technology may one day be used to deliver medications to remote areas. Or when rural patients need more complex blood testing than their local hospital can provide, Lee said, the drones could be used to fly samples to larger medical centers for analysis. A patient in Dexter—a city of fewer than 8,000 people, an hour's drive from the nearest major

hospital—could have a sample sent quickly to a major hospital in St. Louis, for example.

This week, inside a conference room at the Mid-America Transplant offices in St. Louis' Cheltenham neighborhood, Lee stood with Harmon and Valkyrie CEO Catherine Self, taking stock of the 6-foot-by-7-foot drone on display Tuesday. A map of the southern half of Missouri lay on the conference table beside the machine, the distances between St. Louis, Rolla and Springfield marked out in red.

The drone—made by a company in Melbourne, Australia called Swoop Aero—can fly about 100 miles on one charge and carry about 12.5 pounds, Harmon said. So he tentatively envisions basing the drone operations out of Rolla, a city about halfway down the 200-mile St. Louis-Springfield corridor.

Self, the president and CEO of Valkyrie, had driven from Springfield that morning with Harmon, scouting the rough contours of a route the drone may one day take.

Along the drive, Self and Harmon watched for railroad tracks. Setting drone flight paths along railroad corridors is a well-tried strategy for FAA approval, Harmon said, because railroads already use drones to monitor their infrastructure. They observed where populated areas lay, which the drone's path should avoid. And they monitored their cellular connections, a form of communication with the machine.

The drone would likely land somewhere on the edge of the St. Louis region. The companies aren't interested in navigating the drone through densely populated areas, Self said.

Self pointed on the map to a section of St. Charles County where she and Harmon had scouted for potential arrival paths into the region—and then

to a perhaps better option, to the south of the city, where the blue line of the Mississippi River crawled into the metro area.

Harmon stressed the companies have work to do.

"This is all crawl-walk-run stuff," he said.