

Drones in lab operations



Transporting medical samples in far-flung areas is challenging. These samples must be stored with the right level of temperature during the long-haul travel. This is where the use of drones will be a big help.

In a new study, researchers were able to transport chemistry and haematology samples to a site 260 kilometers (160 miles) away using a drone. This has positive implications for collecting medical samples in resource-limited areas where long-distance travel to clinics may be difficult, according to the study published in the American Journal of Clinical Pathology.

The first challenge for the researchers was finding a drone that could fly that long, as most civilian drones don't have the capability to stay in the air that long. "So far, all of the studies involving transport of medical samples were less than 40 kilometers," said Timothy K. Amukele, MD, PhD, assistant professor of pathology at Johns Hopkins University School of Medicine and lead author of the study.

Dr. Amukele's team of researchers found a company in Arizona that manufactured drones that could travel for over 22 hours. Then, they had to custom-build a box to regulate the temperature of the medical samples transported by the drone.

The team collaborated with the Mayo Clinic in Scottsdale, Ariz., to obtain medical samples. The researchers compared samples and flew one set of samples in the drone and one set in the car that travelled the same distance with the air conditioner on. The drone's flight lasted three hours, 258 kilometers. Researchers subsequently took the medical samples to the Mayo Clinic in Scottsdale and ran laboratory tests on them.

The study's aim was to address the stability of biological samples in prolonged drone flights. The research team obtained paired chemistry and haematology samples from 21 adult volunteers in a single phlebotomy event - a total of 84 samples were collected. "Half of the samples were held stationary, while the other samples were flown for three hours in a custom cooling box mounted on the drone," Dr. Amukele explained. "After the flight, 19 chemistry and haematology tests were performed."

It was found that some of the more sensitive tests, such as glucose and potassium, were affected in the samples that remained in the car because the air-conditioned temperatures were not as stringent as those on the drone.

The study suggests that drone can be used to deliver medical samples for long distances, as long as the temperature environment is controlled. As Dr. Amukele pointed out: "The next step is to use this knowledge to implement a drone network for the transport of actual patient medical samples between clinics and laboratory testing sites. We needed this knowledge to inform the next step which involves patient samples. The good news is that this next step, drone transport of real patient samples, is already en route."

Source: [American Society of Clinical Pathology](#)

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