**Drone delivers human kidney: The organ was flown several kilometers by**

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M. Hampson, "Drone delivers human kidney: The organ was flown several kilometers by a

drone without incurring damage - [News]," in IEEE Spectrum, vol. 56, no. 1, pp. 7-9,

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* Organ Transplant Time Sensitivity: The article highlights the critical importance of time in organ transplantation. The longer the delay between the removal of a donor organ and its transplantation into a recipient, the worse the organ's functions become. Therefore, finding efficient methods for organ transport is crucial to maximize transplant success.
* Use of Drones for Organ Delivery: Surgeon Dr. Joseph Scalea and a team of researchers at the University of Maryland explored the use of a DJI M600 Pro drone equipped with a specialized wireless biosensor to measure temperature, barometric pressure, altitude, vibration, and GPS location of a kidney during transportation.
* Future Prospects and Challenges: The experiment showed promise for drone-based organ delivery, however, there are regulatory and operational challenges to overcome in the United States, including maintaining the drone within a pilot's line of sight and altitude restrictions.

The article is about the critical need for efficient and prompt organ transportation within organ transplantation. The urgency is underscored by the fact that every second counts during these vital medical procedures. Delays in the process of transferring a donor organ from its removal to its transplantation into the recipient's body can have profound implications for the functionality of the organ.

Dr. Joseph Scalea, a surgeon at the University of Maryland Medical Center, was inspired to consider alternative delivery methods due to his firsthand experiences waiting for organs to arrive in a timely fashion for transplant surgeries.

To investigate the feasibility of drones for organ delivery, Dr. Scalea, along with a team of researchers chose a DJI M600 Pro drone for this trial. This configuration ensured that the rotors were at a safe distance from the smart cooler containing the organ, thereby preventing any potential heat emission from the motors that might damage the organ.

In March, the researchers were able to obtain a non-transplantable kidney for the purposes of the research. Over a period of approximately 24 hours, this kidney was transported more than 1,600 kilometers to Baltimore, where the drone was prepared for its inaugural delivery mission.

The kidney was airborne for a little over an hour, spanning a total of 14 flight missions. The farthest mission extended to a distance of 2.4 kilometers, mirroring the typical shipment routes between urban hospitals. This comprehensive test revealed that the kidney's temperature remained constant at a cool 2.5 degrees Celsius throughout the flight. The air pressure consistently corresponded with the changes in altitude, and the drone-transported organ reached a peak speed of 67.6 kilometers per hour. A fascinating observation was that the kidney experienced fewer vibrations during transportation by drone when compared to the vibrations endured during a control delivery mission in a fixed-wing plane, specifically a dual-engine turboprop King Air. Importantly, biopsies conducted on the kidney before and after drone transportation revealed no damage, thus solidifying the success of the experiment.