

Portable finger-probe device can successfully measure liver function in potential organ donors

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This device successfully measured liver function in potential organ donors
Credit: Pulsion

A portable, finger-probe device successfully measured liver function in brain dead adult organ donors, a finding that could change the way organs are assessed and save thousands of dollars per transplant, a UCLA study has found.

Working with OneLegacy, the non-profit organ and tissue recovery organization serving the greater Los Angeles area, UCLA researchers measured [liver](#) function in 53 potential organ donors in a blind study of the device. Eleven livers were declined because of poor quality and the other 42 were transplanted and their function tested later to compare to the results obtained using the device, said study first author Dr. Ali Zarrinpar, an assistant professor of surgery in the Division of Liver and Pancreas Transplantation.

"This device is best single predictor of organ survival in our patients," Zarrinpar said. "Ultimately, what it does is gives us a quantitative measure of how good a liver is without having to visually inspect the organ. It gives us a measurement to talk about when we're thinking about whether to transplant an organ into a recipient."

The study appears in the early online edition of the *Journal of Surgical Research*.

Although there are accurate and reliable function tests for other donor organs, this is not the case for livers, Zarrinpar said.

Currently, depending on a thorough assessment of a potential donor's

medical history, multiple blood tests and any hospital treatments, a surgical team from the recipient's medical center is dispatched to the donor's location to visually inspect and potentially procure the organ. That team costs thousands of dollars per procedure, Zarrinpar said, and about 10 to 15 percent of the time the organ is deemed unusable.

On the flip side, an organ from a patient with a questionable history or borderline laboratory results may be considered a waste of the surgical team's time and the retrieval effort abandoned. However, this device could easily be used to test organ function in such marginal donors, so its use could increase of number of organs used for transplant.

"Although the number of transplant candidates continues to grow, organ availability has plateaued, resulting in more patients dying while on transplant waiting lists," Zarrinpar said. "This device, which can be used in any hospital, could help increase the number of donor livers and help save very sick patients waiting for transplant."

The device operates much like a pulse oximeter, which attaches to the finger to measure oxygen in the blood. In this case, the device measures the rate at which a dye, injected into the potential donor's bloodstream, is cleared by the liver. This novel, non-invasive and rapid test successfully predicted which livers would function properly in transplant patients, Zarrinpar said.

A [liver transplant](#) may involve the whole liver, a reduced liver, or a liver segment. Most transplants involve the whole organ, but transplants using segments of the liver have been performed with increasing frequency in recent years. This would allow two liver recipients to be transplanted from one donor or to allow for living donor liver donation.

Every year, more than 1,500 people die waiting for a donated liver to become available. Currently, about 17,000 adults and children have been

medically approved for liver transplants and are waiting for donated livers to become available, according to the American Liver Foundation.

"These data warrant further exploration in a larger trial in a variety of settings to evaluate acceptable values for donated livers," the study states. "At a time of increasing regional sharing and calls for national organ sharing, this method would assist in the standardization of graft evaluation. It could also lead to increasing liver graft utilization while decreasing travel risk and expenses."

The research was funded by the Dumont-UCLA Transplant Center and the National Institutes of Health (UL1TR000124).

The liver transplant program at UCLA was inaugurated in 1984 and has grown to be the most active program in the world. Since the program's inception, liver transplants have been performed at UCLA for infants, children and adults, focusing on innovative surgical techniques, advances in immunosuppressive drugs and quality patient care.

As the most experienced liver transplantation program in the western United States, UCLA serves patients from California, Oregon, Washington, and throughout the Southwest, and acts as a tertiary referral center for other transplant programs faced with particularly challenging cases.

Provided by University of California, Los Angeles

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