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WINTER 2013 CONSULT

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Wearable artificial kidney trial to begin in next year

In the next year UW Medicine will begin a clinical trial of a wearable artificial kidney. The battery-powered device, about 10 pounds, is belted around the waist, designed to emancipate patients with end-stage kidney disease from being tethered for hours, several days a week, to refrigerator-sized hemodialysis machines.

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Initial proof-of-concept tests with patients in Europe suggest that the device provides "excellent clearance of blood-waste products, partly due to a pump that's different from any pump used in conventional dialysis machines," said Dr. [Jonathan Himmelfarb](#). He directs the Kidney Research Institute, a collaboration of UW Medicine and Northwest Kidney Centers.

Those tests involved patients wearing the device for brief spans, he hastened to add, and much more needs to be understood about the device's safety and effectiveness in longer-term use.

Criteria for determining patient eligibility and other protocol details are being defined by Himmelfarb and Dr. Larry Kessler, chair of health services for UW's School of Public Health; the Food and Drug Administration; and the device's inventor, Dr. Victor Gura, a nephrologist at the University of California, Los Angeles, medical school.

Gura approached Himmelfarb several years ago, recognizing the institute and UW Medicine's achievements and capabilities in translating research into clinical care for patients with kidney disease.

Some patients live 20 years or more on dialysis, but survival is much shorter for most others. "We don't always understand why," Himmelfarb said. "Every person adapts differently to dialysis, and the extent to which people can make lifestyle adaptations to optimize dialysis also clearly plays a role."



A woman models a prototype of a wearable artificial kidney. On the right is the device inventor, Dr. Victor Gura of UCLA.

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Dr. Elizabeth Kendrick, UW clinical assistant professor of medicine, with a kidney donor. Photo by Clare McLean.

The goal is to improve quality of life for this population, for whom complications of lost kidney function can progress even with the benefit of dialysis.

Many people on dialysis are wait-listed for kidney transplant. The likelihood of that outcome, however, is no better than it was 10 years ago. In fact, across the nation, the rate of kidney transplant in 2012 has significantly lagged that of recent years, according to the U.S. Organ Procurement and Transplantation Network. Midway through 2012, for example, Washington state and Oregon surgeons had performed 149 kidney transplants, far off the pace of their combined 536 such procedures in 2011 and 551 in 2010.

The rate of living kidney donation is down markedly, too. From 2001 to 2010, living donors precipitated 41.5 percent of kidney transplants in Washington and Oregon. The comparative rate so far this year is 28 percent; in 2011, it was 34 percent.

The increased prevalence of obesity and diabetes might be reducing the pool of likely prospective donors, said Dr. [Elizabeth Kendrick](#), a UW Medicine nephrologist.

“Those conditions certainly could have a negative impact on people who donate and only have one kidney left,” she said. “We disqualify prospective donors with potentially significant risk factors based on family history or other reasons.”

Guidelines have been published, but no U.S. standard exists for determining whether prospective donors are sufficiently healthy. Every donor center can apply its own criteria, Kendrick said.

“We’ve turned down people because of potential risks, and they have gone to other centers in Seattle and been accepted to donate. Individuals might see us on the more conservative side, but our bottom line is safety. We don’t want to increase any recipient’s risk for developing disease somewhere down the line.”

To refer a patient or learn more, contact the Renal Clinic via the UW Medicine Contact Center: 206.520.5000.

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Dr. Jonathan Himmelfarb is director of the Kidney Research Institute and a UW professor of medicine.

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