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Resident's patent offers hope for those waiting on kidneys

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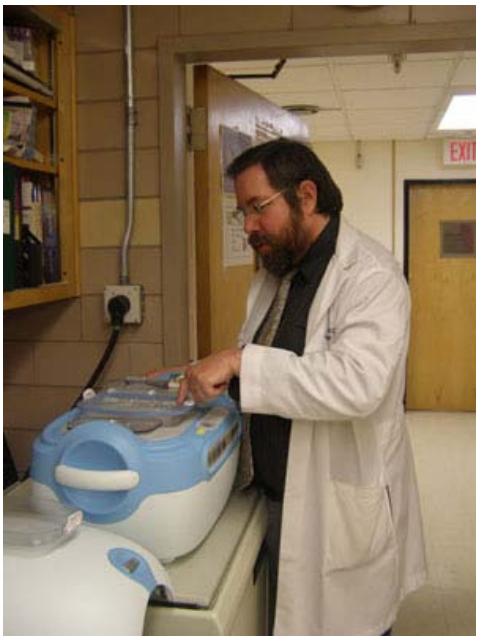

As of 1:30 p.m. on Monday, December 19, there were 90,360 people in the U.S. in need of a kidney transplant.

Though the number of people on the transplant list fluctuates constantly, one thing is certain: Not everyone who needs a kidney gets one.

Dr. Martin Mangino, a Powhatan resident and research scientist in VCU's Department of Surgery, has devoted much of his career to solving this problem.
Mangino, who has been working in the field of organ preservation since the mid-1980s, received a patent earlier this month for a procedure that helps to preserve the kidneys of donors whose hearts have stopped beating.

Mangino explained that there are two main types of donors: living and dead. The dead donors are then further divided into types: brain dead and heart dead. "Over the past 30 years," Mangino said, "probably 98 percent of all organ donations from dead donors have come from brain dead donors."

"The problem," Mangino explained, "is that most people don't die from brain death."

"Brain death occurs maybe one percent of the time. The stars have to line up just right. You have to suffer some kind of a traumatic brain injury – a car accident, trauma, you're shot in the head, you're kicked in the head by a horse."

Mangino is hoping to make possible what researchers at universities and hospitals across the world – including ones in Pittsburgh, Wisconsin, and Japan – have been working on for years: the transplantation of organs from people who die unexpectedly of cardiac death.

"Most of us die from cardiac death," Mangino explained. "That's the other 99 percent of the pool. If we could harvest those organs that could help us bridge that gap."

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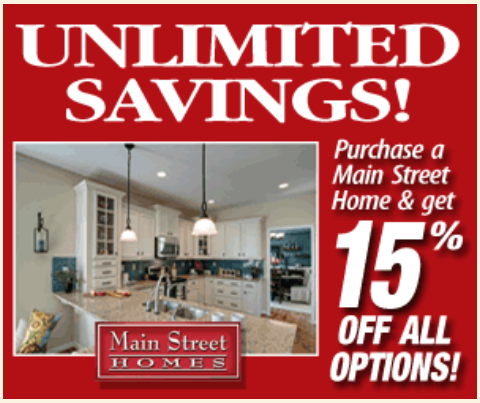
According to Anne Paschke, a spokesperson for the United Network for Organ Sharing, more than 16,000 kidney transplants were performed in the U.S. in 2010 – of these, 10,622



kidneys came from deceased donors and 6,277 came from living ones. (Because human beings have two kidneys, and can function remarkably well with only one, they can be transplanted whole from one living person to another. However, it is also possible for a living donor to give a portion of his or her lung, liver, pancreas, or intestine.)

Still, in the same year, more than 4,000 Americans died while on the waiting list.

The reason, Paschke said, is that there is simply a shortage of donors. Although the procedure is generally safe and successful, there are a lot of reasons a living person might not want to donate a kidney.

"There are people who have died giving kidneys," Paschke said. "You have to weigh the risk versus the reward." She added that undergoing a kidney donation operation "is certainly not pain-free" and the time off work and loss of income is simply not an option for many would-be donors.

"The more [organs] we could utilize from deceased donors," Paschke said, "definitely the better."

The procedure Mangino has patented basically involves inserting a catheter into the abdomen of a deceased patient and flushing the kidneys with a chemical solution that will keep them cool and prevent what doctors call warm ischemia, from setting in.

"The point of this bridging procedure," Mangino said, "is to buy a little bit of time so that we can preserve those organs in-situ, or inside the body. Even a small drop in temperature will buy us a lot of time."

Mangino knows that there are several obstacles to overcome before his invention can make its way from the laboratory into the operating room: There's FDA approval (an entirely separate process from a patent); there are state laws that make organ donation difficult because of next-of-kin notification regulations; there is the dearth of hospitals actually equipped to perform this procedure.

Still, Mangino is hopeful that his invention can soon begin saving lives.

"We're poised to actually start doing this, to take advantage of all the people, all the unfortunate people, who come into our emergency department and expire and are on the registry."
Mangino believes that this procedure could, by a conservative estimate, increase the donor pool of kidneys by 30 percent "in the first year alone."

"That's huge if you happen to be a patient tied to a dialysis machine," Mangino said. "Getting those people off dialysis as quickly as possible is key to a successful transplant."

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