ICU
MANAGEMENT & PRACTICE

Take A Kidney Transplant Now Or Wait For A Better One?

Johns Hopkins scientists have created a free, Web-based tool to help patients decide whether it's best to accept an immediately available, but less-than-ideal deceased donor kidney for transplant, or wait for a healthier one in the future.

Historically, the researchers say, it has been difficult, if not impossible, to accurately quantify the risk of accepting a deceased-donor kidney that may have been infected by hepatitis C, as compared to waiting what could be months or years for a better organ. There is a 5 to 15 percent chance of dying every year on the waiting list. Often, organs that may have been at risk of infection are thrown away and never transplanted.

In a new study described online in the *American Journal of Transplantation*, the Johns Hopkins researchers showed there are some types of patients for whom survival benefit outweighs the risks of accepting a possibly infected organ. They then developed a Web-based mathematical model to help predict which patients they would be. The easy-to-use website can be found at **www.transplantmodels.com/ird**.

"Because the supply of the healthiest donor organs is too small, patients need to consider all organ offers or risk dying while waiting for an organ. But this is a very hard decision, and many people turn down transplant offers that, in reality, would provide them significant benefit. Often they would have done much better taking the organ at hand than waiting for the next available one," says study leader Dorry L. Segev, M.D., Ph.D., an associate professor of surgery at the Johns Hopkins University School of Medicine. "This is the most important decision of a transplant candidate's life, and we have developed a novel tool we believe can help patients make the best choice."

Before they are made available for transplant, kidneys and other organs from deceased donors are tested for infectious diseases such as HIV and hepatitis C. But even when the tests come back negative, there is still a chance that some kidneys could be infected, more commonly with hepatitis C, because of donor risks such as intravenous drug abuse, prostitution, imprisonment and other criteria established by the U.S. Centers for Disease Control and Prevention. Although the risk of transmission of hepatitis C is low for transplanted kidneys, more than 10 percent of deceased donors in 2011 met the CDC criteria for infectious risk.

To develop the model, Segev and his colleagues pooled data from dozens of published papers and national databases of hundreds of thousands of patients. When information was missing, they sought out expert opinion to fill in the holes. They considered how long patients had been on a waiting list, whether they had undergone previous transplants, their age and whether they had diabetes, among other factors. Finally, they developed a complex statistical model and computer program to take all the factors into account and present it in a user-friendly manner.

Segev says there are more than 102,000 people on the kidney transplant waiting list in the United States, and thousands will die before they get an organ. The average waiting time for a kidney is three to five years, but in some regions of the United States, it can be as long as 10 years.

Some kidney transplant patients are healthy enough to safely reject a risky organ and wait for a better one. But that is not always the case.

Segev gives as one example a 45-year-old male who has been waiting two years for a new kidney, and thinks he has three more years to wait. Should he take an at-risk kidney, the Web-based tool says he would have a 78 percent chance of being alive in five years, even accounting for the possibility of an undetected infection such as hepatitis C. If he turns it down, his five-year survival is estimated to be 60 percent. It would make sense, according to Segev, for this patient to take the kidney, because trying for a better kidney would actually result in much worse outcomes.

The story is different, he notes, for a 25-year-old male who has been on the waiting list for four years and likely has one more year to wait. If he takes the risky organ, he has an 84 percent chance of five-year survival. The chance of five-year survival is 83 percent if he waits for a better organ to come along.

"In this example, it's not worth taking the risk of an infectious disease because you'd do just as well with the next organ without any risk of disease," Segev says. "At the end of the day, this is a personal choice, and it's hard to know which organ is the right one for you. But we hope this makes the decision easier, by clearly illustrating what would be predicted to happen depending on the choice you make."

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