

New allocation formula could prevent waste and transplant delays

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Only a small fraction of transplant centers nationwide are willing to accept and transplant deceased-donor kidneys that they perceive as less than perfect, leading to lengthy, organ-damaging delays as officials use a one-by-one approach to find a willing taker. Now, Johns Hopkins researchers have designed a formula they say can predict which donor kidneys are most likely to be caught in that process, a method that could potentially stop thousands of usable kidneys each year from being discarded because it took too long for them to be transplanted. Previous studies have shown such kidneys can extend the life of certain dialysis patients, if allocated and transplanted in a timely manner.

The researchers who developed the formula, published in the [American Journal of Transplantation](#), say they hope it will be used to speed up the organ allocation process for hard-to-place kidneys and improve transplant outcomes nationwide. Hard-to-place kidneys are generally those from older donors, those with a history of smoking, [hypertension](#), diabetes, stroke, [hepatitis C](#) or high-risk behavior such as intravenous drug users, but previous studies by Hopkins researchers show that for many recipients they work well, save lives, and are superior to longer waits for patients on dialysis.

"The longer a kidney stays out of the body, the worse the outcomes are going to be and the more likely that kidney doesn't even get transplanted," says Dorry L. Segev, M.D., Ph.D., an associate professor of surgery at the Johns Hopkins University School of Medicine and the study's leader. "The idea was to figure out which kidneys are most likely

to be delayed and more quickly get organs to the transplant centers that will use them. This formula does that."

Segev and his colleagues developed a model with 80 percent positive and negative predictive value for identifying kidneys from deceased donors likely to be delayed more than 36 hours and/or discarded. These are the kidneys for which expedited allocation is most necessary. They studied 39,035 adult kidneys recovered from deceased donors for possible transplantation between 2005 and 2008. Of those kidneys, 27.4 percent (10,410 kidneys) were either held outside the body for more than 36 hours or discarded — with the lion's share, 9,262, eventually discarded.

Segev says data from his study — and the new predictive model of how organs will fare — suggests that a new allocation method that offers hard-to-place kidneys to all centers at once makes more sense. When a reasonable time period has passed, the kidney would go to the accepting center with the patient who is closest to the top of the transplant list.

Under the current allocation system for allocating kidneys from deceased donors, when a kidney becomes available, it is first offered to local transplant centers. If no one locally claims the kidney, it is then made available to the national kidney transplant list, with the person who has been waiting the longest standing first in line to receive a new organ. Not all kidneys are claimed immediately. Some centers, even those with patients at the top of the transplant list, are less likely to accept kidneys from older donors or from donors with certain medical conditions — even though Segev says the transplant can be very beneficial for the right patient. In fact, according to the study, only 5 percent of the nation's 253 transplant centers had transplanted more than two of these harder-to-place kidneys in the previous year.

Current protocol also gives the center with the patient at the top of the list an hour to accept or reject the kidney before it goes to the next

center on the list and so on and so on. A kidney — which is stored on ice once out of the body — could go through many centers before being claimed or could be rejected so many times that it has been out of the body too long to be usable, Segev says. It can also take more than a dozen hours from the time the organ is claimed until the time it is transplanted into the recipient. Precious time and organs are lost, he says, when these kinds of kidneys are offered to centers that experience has shown are likely to turn them down time and again.

"You can't allocate all kidneys in the same framework," says Segev, Johns Hopkins' director of clinical research for transplant surgery. "With a [kidney](#) you know will be difficult to place, we have to take a different approach. We need to get it to the most aggressive centers. Waiting for all the other centers to say no unnecessarily delays the process."

Provided by Johns Hopkins Medical Institutions

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