

# Younger Patients Living Longer After Heart Transplant

Heart transplant patients who receive new organs before the age of 55 and get them at hospitals that perform at least nine heart transplants a year are significantly more likely than other people to survive at least 10 years after their operations, new Johns Hopkins research suggests. Examining data from the more than 22,000 American adults who got new hearts between 1987 and 1999, researchers found that roughly half were still alive a decade after being transplanted and further analysis identified factors that appear to predict at least 10 years of life after the operations.

"There are 2,000 to 2,500 heart transplants a year in the U.S. and many people die waiting," says Arman Kilic, M.D., a surgical resident at The Johns Hopkins Hospital and leader of the study published in *The Annals of Thoracic Surgery*. "We have to be very smart about how to allocate scarce organs, and our research suggests we can predict which patients will live longer with a new heart." Kilic and his colleagues used information collected by the United Network of Organ Sharing (UNOS) and compared the 9,404 heart transplant recipients who survived for 10 or more years with the 10,373 who did not. Some 3,000 were lost to follow-up.

The researchers found that patients 55 and younger had a 24 percent greater chance of 10-year survival than older patients. Those treated at hospitals performing nine or more heart transplants a year had a 31 percent greater chance of 10-year survival than those at lower volume centers, and white patients were 35 percent more likely to survive a decade than minority patients. Kilic says that nearly half of heart transplant recipients in the study were over 55 and there is debate over how old is too old to undergo the surgery. "After the age of 55, we see the biggest difference in long-term survival," he says. "The chance of surviving for 10 years drops precipitously."

Patients at high-volume centers do better not only because their surgeons likely have more experience with heart transplants, but also because the staff and facilities are likely better equipped to manage the complex post-operative care of these patients and promote good outcomes, Kilic says. The researchers noted that patients who were on ventilators before their transplants were 47 percent more likely to die within 10 years of surgery. People who require breathing machines before surgery are much sicker than those who do not, so it makes sense that those patients would do poorly, Kilic says. In addition, diabetics were one-third more likely to die within 10 years of transplant.

The study results also show the impact on long-term survival of ischemic time, or how long the heart is out of the body as it travels from donor to recipient. For every hour ischemic time was reduced, the researchers found an 11 percent increase in

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the chance that the recipient would survive for a decade or more. The age of the donor was also significant. For every decade younger the donor was, the recipient was 10 percent more likely to survive long term, Kilic says.

Under current regulations and policies, UNOS gives available hearts to the sickest patients on its national waiting list, typically those whose doctors predict they will not survive a month without a new organ. Kilic agrees with the policies, but suggests it may be useful to give priority within this sickest group to patients who — using his data — would likely survive the longest.

"These data could be used for both prognosis and allocation purposes," Kilic says. "They help predict which patients have the best chance to derive the longest and most sustainable benefit from the limited number of hearts that become available each year. It also identifies areas that need further research, such as why racial disparities exist in long-term survival following heart transplant."

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