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Key Words: heart transplant, cardiac donor selection, organ utilization, transplant stewardship

EDITORIAL COMMENTARY

Saying yes or saying no!

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Disclosures: Author has nothing to disclose with regard to commercial support.

Received for publication Sept 15, 2015; accepted for publication Sept 16, 2015; available ahead of print Oct 27, 2015.

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0022-5223/\$36.00

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<http://dx.doi.org/10.1016/j.jtcvs.2015.09.073>

In their article in this issue of the *Journal*, Smith and colleagues¹ from the University of Washington in Seattle demonstrate an impressive increase in donor heart use at both the transplant center and the local organ procurement organization through a multidisciplinary retrospective review of organ use practices. In the course of 3 years, their acceptance rate of offered hearts increased from 28% to 60%, doubling the transplant volume without an increase in transplant-associated mortality. Whereas intercenter organ use is a zero-sum game, if each organ procurement organization could increase the organ use by 7% annually, an additional 150 hearts could be transplanted in the United States each year.

The readers are challenged to ascertain how Smith and colleagues made such dramatic changes. Smith and colleagues refer somewhat euphemistically to “behavioral

adaptation” and “frank discussions” regarding “individual and group bias” as explanations, but understanding exactly how this is accomplished is not easy.

In his number one best seller *Thinking, Fast and Slow*, Daniel Kahneman,² (Nobel Prize in Economics in 2002)

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Central Message

Decision making with incomplete information is challenging. Multidisciplinary involvement reduces biases and increases organ use.

See Article page 238.

reviews the psychology of judgment and decision making. He described 2 modes of thinking, an automatic or intuitive system requiring little thought and under minimal control and another effortful system used to make complex calculations. We often think that we are using the latter when it is in fact the former, and there are biases or influences that may affect our more cognitive efforts. How might this affect organ use, and how could a retrospective review of cases change acceptance rates?

Let's say an offer is submitted to a surgeon without any knowledge of the recipients on the list. He or she is given a list of facts and must make a provisional calculation of the risk of the donor offer. The risk to recipients that night if nothing is done is estimated at 0%. The risk of using the heart from this donor is calculated at around 10%. The first factor impacting the decision is known as the possibility effect. Increasing the possibility of death from 0% to 10% by proceeding with a transplant (death is now a possibility) is weighted much more negatively than it would be if the base mortality that night (or during the next few weeks) for the recipient was 10% and the donor risk were 20%. The absolute risk increase for both is 10%, but we are much more likely to decline an offer in the first situation. This may explain why it is increasingly challenging to accept anything but near-perfect offers for stable outpatients on left ventricular assist device support.

Poor understandings of base rates and time-related risks as well as the use of heuristics compound this problem. A heuristic is a simplifying formulation used to find an adequate but imperfect solution to a difficult problem. Most studies estimating donor risk have looked at ischemic time and donor age as the 2 most important variables, and they have been unnaturally separated into dichotomous variables of less than 4 hours of ischemia and younger than 40 years.³ At 2 o'clock in the morning, my risk calculator simplifies things, concluding that donors who have more than 4 hours of ischemic time and are older than 40 years are risky. If I work at it, I may remember the odds ratio is somewhere around 2 for those older than 40 years and with more than 4 hours of ischemia, but I would not remember that the 1-year survival difference between younger age and shorter times and older age and longer times is 6% (89% vs 83%; odds ratio, 1.6; 95% confidence interval, 1.3-2.2).⁴ In addition, the comparison of risks should look at the best solution for the patient during the next 6 months, not just at the moment. Roughly 25% of patients on the transplant list die or become too sick to receive a transplant in the course of 12 months. From the patient's perspective, any assessment of donor risk needs to beat these odds. For a patient in status 1A and Interagency Registry for Mechanically Assisted Circulatory Support level I looking at a complex reoperative insertion of an assist device as a bridge to transplant, a 41-year-old donor heart with 4 hours

and 30 minutes of ischemic time is the obvious choice. The use of simplifying heuristics to estimate risk can result in biases that reduce transplant acceptances.

At a transplant selection committee meeting, I witnessed the phenomenon of anchoring. All cardiac surgeons have experienced this phenomenon. Let's say that a given donor and recipient combination has been used a 1000 times, so we can fairly reliably estimate the risk of death at 10% with 95% confidence interval ranging from 6% to 18%. The surgeon who is asked for an opinion of the match recalls that the last similar patient died after 10 weeks in the intensive care unit, and when pressed estimates at least a 20% mortality if the organ is accepted. The cardiologist, on the other hand, remembers 3 patients who had similar matches and have done remarkably well. If pressed, the cardiologist would estimate a 5% chance of mortality. Both these estimates are statistically plausible and are anchored or weighted by the last memorable or distressful experience.

Another unfortunate example of anchoring is the Center for Disease Control and Prevention's high risk (CDCHR, for transmission of viral infection) donor label. The call that a surgeon will receive from the coordinator will say, "I have a great heart offer, but it is a high-risk donor," meaning that the donor meets CDCHR criteria. In fact, the risk of viral transmission is still exceedingly low, but an analysis of CDCHR kidney donors showed they were one-third less likely to be used, and it was not the recipient who was declining the offer but the physician.³ The Seattle group notes that they are using more CDCHR donors.

It is very challenging to assess risk with incomplete information. I have suggested a few factors that may influence our decisions. Many others exist, including fatigue, scheduling conflicts, reimbursement issues, and meeting outcome metrics for accreditation and contracting. The University of Washington team had the courage to examine their decisions and, working as a collaborative multidisciplinary team, to explore ways to understand and clarify the risks of action and inaction, uncover conscious and unconscious biases and influences, and collectively and blamelessly support each decision. I would encourage more transplant centers to follow a program similar to the University of Washington's, and maybe we will be hearing more yeses and fewer nos.

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