the cardiac transplant community now has another tool: the RVM donor–recipient matching calculator available at www.rvmcalc.com. This tool may indeed help with difficult donor–recipient decisions such as the one I described in my introductory paragraph.

The most recent data from the International Thoracic Organ Transplant Registry of Adult Heart Transplantation[3] illustrate the desire and movement to expand the pool of donor cardiac allografts. This expansion of donor cardiac allografts includes those from older age donors with more comorbidities. Accepting a greater number of these donor hearts may prove beneficial in addressing the imbalance of donor heart–recipient supply and demand. However, the use of older donor hearts, with perhaps greater RVM mismatch, needs to be balanced with appropriate outcomes.

The current study by Kawabori and colleagues[1] adds important insights and hopefully will be hypothesis generating to further refine the relationship between right ventricular function and outcomes after cardiac transplantation.

References

1. Kawabori M, Cristenelis AC, Hironaka CE, Chen FY, Zhan Y, Thayer KL, et al. Right ventricular undersizing is associated with increased 1-year mortality. *J Thorac Cardiovasc Surg*. 2021;161:1048-59.e3.
2. Costanzo MR, Dipchand A, Starling R, Anderson A, Chan M, Desai S, et al. The International Society of Heart and Lung Transplantation guidelines for the care of heart transplant recipients. *J Heart Lung Transplant*. 2010;29:914-56.
3. Khush KK, Potena L, Cherikh WS, Chambers DC, Harhay MO, Hayes D Jr, et al. The international thoracic organ transplant registry of the International Society of Heart and Lung Transplantation; 37th adult heart transplantation report- 2020; focus on deceased donor characteristics. *J Heart Lung Transplant*. 2020;39:1003-15.

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Commentary: Seriously, it's just math

Ashish S. Shah, MD

Over the last 50 years of clinical heart transplantation practice, the decision to use a particular donor for a particular recipient seems to boil down to the judgment of a clinician in the middle of the night staring at a screen. What has been described in the literature as "standard donors" never seem to be that way over the phone. Moreover, and even with a normal echocardiogram and age <40 years, we worry about "size." How do we decide when a heart is too small for a particular recipient? The anxiety is real. Too small a heart may be inadequate to manage early postoperative needs and may impact long-term physical functioning. So we use height, weight, and sex.

Ashish S. Shah, MD

CENTRAL MESSAGE

Donor and recipient matching in heart transplantation enters a new era with a focus on myocardial mass and math.

All this seems quite sensible, except when we consider that there are insufficient hearts to meet the demand. Any unused heart is poor stewardship of a public trust. Even in the modern era of big data where the absolute survival differences between undersized and sex-mismatched hearts seem to be small, our anxieties remain. The article by Kawabori and colleagues[1] in this issue of the *Journal* adds to the growing body of literature suggesting that using

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echo-derived measures of ventricular size and mass may provide a better understanding of the risk associated with donor and recipient mismatching. The authors expand on the notion of total myocardial mass to focus on the calculated right ventricular (RV) mass. Using US registry data and simple calculations, the authors convincingly show that RV predicted mass can identify patients at increased risk of death at 1 year. When using this calculation, a certain percentage of patients who conventionally would have been considered too small would have been an appropriate RV size match, with no increase in 1-year risk. No sex, no ischemic time, no immunology, no logistics, no ventricular assist device—just math. This is an attractive model because it lends itself to an objective allocation of organs, a way to smooth out practice across the country, and removes so much of the dogma that plagues heart transplantation.

There are a number of problems with this approach, however. First, the calculation is based on normal hearts. Second, any echocardiography-derived measure of RV function is problematic. Even under optimal conditions, imaging this complex shape is difficult. The recipient does not have a normal heart and may not have normal lungs; thus, the idea of how pulmonary hypertension may or should adjust the calculation is not clear. The increased risk associated with oversized hearts is a surprising finding and poorly explained. Finally, although 1-year survival is important, it's far from the only thing when it comes to size matching. Functional outcomes need to be the new 1-year target for the field. Exercise tolerance, quality of life, and even biomarkers of heart failure will be the new metric that matters. As Lord Kelvin exhorts us in his most famous quotation, "when you cannot express it in numbers, your understanding is of a meager and unsatisfactory kind."[2] Numbers please.

References

1. Kawabori M, Cristenelis AC, Hironaka CE, Chen FY, Zhan Y, Thayer KL, et al. Right ventricular undersizing is associated with increased 1-year mortality. *J Thorac Cardiovasc Surg*. 2021;161:1048-59.e3.
2. Kelvin L. Available at: https://www.azquotes.com/quote/530295. Accessed November 19, 2020.