Commentary: “Location, location, location”—A motto surgeons need not adopt

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With the increasing number of aortic valves being implanted in the elderly population in the United States,¹ the large-scale retrospective cohort study of geographic variation between mechanical and bioprosthetic valve choice among Medicare recipients 65 years old or older, published in this issue of the *Journal* by Du and colleagues,² is particularly timely. Major strengths of their investigation include the sheer volume of patients analyzed, the demonstration of practice trends during the decade of study (2006-2015), and a thoughtful identification of factors associated with mechanical valve implantation.

The finding by Du and colleagues² of decreasing rates of mechanical valve implantation in the United States is not surprising. Given the risk of thromboembolic complications with mechanical valves, the potential for increased bleeding complications in this age group with even short-term anticoagulation,³ and the promise of valve-in-valve transcatheter aortic valve replacement to mitigate surgeons' concerns regarding structural deterioration and the need for reoperative surgery, one could understand why even younger patients might opt for a bioprosthetic valve.^{4,5}

Less intuitive, and perhaps the main limitation of this investigation, is the rationale for the significant regional variation in implantation practice that was seen, not only between New England and the South, but also between states within a region. These unexpected findings prompted us to take a cursory look at implantation practice within the Veterans Health Administration, performed with a dataset that had been recently obtained to examine antithrombotic prescribing practices after bioprosthetic aortic valve implantation.⁶ Similar to the findings of Du and colleagues,² the proportion of mechanical valves implanted across various Veterans Integrated Service Network regions also appeared to vary substantially (Figure 1), with percentages ranging from less than 5% to more than 40% (D. Bravata, D. Kanagara, and L. Myers, personal communication, February 19-28, 2019). Other than the obvious determinants of age and perhaps atrial fibrillation, reasons for this wide variation

Mechanical vs bioprosthetic aortic valves implanted within Veterans Health Administration.

Central Message

Geographic variations in practice and outcomes deserve closer examination; choice of valve type for elderly patients undergoing aortic valve replacement appears to be no exception.

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are unclear. Du and colleagues² noted provider-related factors associated with mechanical valve implantation; these included less surgeon experience and lower hospital volume. It seems doubtful, however, that these determinants tell the whole story. More likely, there are additional contributing factors, including those pertaining to patients, that are subtle enough to elude capture in this and most other studies of practice and outcome variation. This was the conclusion I reached some years ago, after a study examining regional variation in outcomes after coronary artery bypass outcomes that used the Society of Thoracic Surgeons Adult Cardiac Surgery National Database.⁷

As studies of variation in practice and outcome of aortic valve replacement continue to emerge,⁸ one thing is certain at the end of the day: The treatment of patients with aortic valve disease is rapidly evolving. The study by Du and colleagues² should prompt each one of us to take a closer look at our individual practices and the patients we treat. This might serve as a first step in understanding how we might go about achieving a more uniform standard of care across all regional metrics—and leave the saying “It is all about location” to the realtors.

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FIGURE 1. Mechanical versus bioprosthetic aortic valves implanted within Veterans Health Administration.

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