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Commentary: “The road less traveled...”

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Robotic-assisted cardiac surgery continues to evolve since first described more than 2 decades ago.¹ Early experience has been highlighted in previous publications of the *Journal*, followed by large institutional case series chronicling the growth of robotic cardiac procedures and outcomes.²⁻⁴ In the current issue of the *Journal*, a preeminent group of US-based cardiac surgeons with extensive robotic experience provide an Expert Opinion manuscript proposing a pathway to “contemporary robotic cardiac surgical training.”⁵ The authors highlight growing interest in the application of robotic technology to cardiac procedures including predominant mitral valve repair and coronary revascularization.

Historically, vendor support provided most of the robotic training; however, the current model emphasizes institutional program initiation and development with minimal vendor support. Based on the extensive clinical experience and consensus, the authors present recommendations for both cardiac surgeon and robotic team development. Their recommendations encompass 2 pathways: robotic-assisted coronary revascularization and robotic-assisted valve and related intracardiac procedures. They highlight the importance of a dedicated robotic team with institutional and provider commitment to education, training, and continued program development. Suggested minimum volume criteria are presented, which include on- and off-pump coronary surgery experience in the revascularization pathway and mitral valve repair experience (both open and less invasive). Successive steps in the operation are presented for each robotic pathway allowing a “compartmentalized” approach to the procedure. Compartmentalizing and independent tracking of

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CENTRAL MESSAGE

Training pathways are necessary to initiate and sustain robotic cardiac surgical programs.

each operative step over time is a more effective measure of surgeon/team proficiency. This model constitutes a novel recommendation and a paradigm shift in surgical training regardless of operation or approach performed, an important message. Furthermore, the authors introduce recommendations for tiered training with increasing levels of complexity as the team progresses. Computer simulation and robotic vendor-produced trainers are incorporated as effective training methods.^{6,7}

This manuscript constitutes an important document written by some of the strongest proponents of robotic cardiac surgery and warrants consideration among cardiac surgeons. Despite several decades of procedural development, the adoption rates for cardiac robotic technology both nationally and internationally remain low. One important criticism of robotic surgery has been its use as a marketing tool to garner referrals, often with claims not fully supported by peer-reviewed literature. In addition, consensus on the requirements for procedural volumes necessary to initiate and maintain proficiency in robotic surgery has been lacking. The current Expert Opinion manuscript, with clear recommendations for program development, in addition to growing national support from both the Society of Thoracic Surgeons and the American Association for Thoracic Surgery are important steps to counter these criticisms. The suggested procedural volume requirements are expected to be controversial. While necessary to ensure technical excellence, disparities in surgical volumes currently exist among programs in the United States. Solutions to these disparities require a national discussion that extends beyond a single technology (robotic or otherwise). Several of the authors have spent decades

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perfecting robotic procedures and should be congratulated for their leadership, perseverance, and commitment to developing these procedures. Having taken “the road less traveled,” these investigators look to guide others along their way.

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