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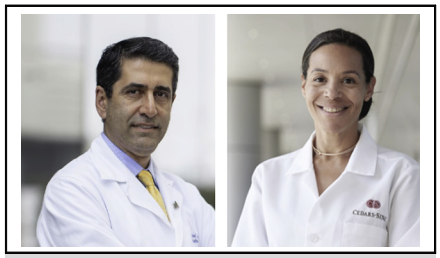
# Commentary: Time to make multiarterial revascularization a quality metric

Fardad Esmailian, MD, and
Joanna Chikwe, MD, FRCS



Fardad Esmailian, MD, and Joanna Chikwe, MD, FRCS

**CENTRAL MESSAGE**

Establishing multiarterial bypass as a publicly reported quality metric may be the most effective driver of practice change within our immediate purview.

ADULT

In this issue of the *Journal*, Vallely and colleagues[1] address 3 challenges of convincing cardiac surgeons of the benefits of multiarterial grafting. Arterial conduits have been associated with better long-term patency than saphenous vein grafts, and observational studies have shown that multiarterial revascularization is associated with superior long-term survival and freedom from myocardial infarction and reintervention compared with single-arterial revascularization in younger patients.[2] Yet, even in very young, low-risk patients, multiarterial revascularization strategy is used in less than 15% of coronary bypass operations in contemporary practice, and there is extreme practice variation between individual surgeons in frequency of use.[3,4]

The first reason identified by Vallely and colleagues[1] for the overall low use is the lack of evidence from randomized studies. The Arterial Revascularization Trial, in which 3102 patients were randomized to single or bilateral internal thoracic artery, showed no survival difference in the intention-to-treat analysis.[5] There was a significant mortality reduction at 10 years in the as-treated analysis, and this discrepancy has been attributed to cross-over between study arms: One-fifth of patients randomized to single arterial strategy received the radial artery as a second arterial conduit, and 14% of patients randomized to bilateral arteries only received 1 internal thoracic artery. The Randomized Comparison of the Clinical Outcome of Single Versus Multiple Arterial Grafts trial was designed to address this but may not report until 2025.[6] The second obstacle highlighted by Vallely and colleagues[1] is concern over sternal wound infection: There was double the rate of sternal complications in the bilateral internal thoracic artery cohort of the Arterial Revascularization Trial. To the reduce the risk of incisional complications, Vallely and colleagues[1] emphasize the importance of internal thoracic artery skeletonization and using radial artery as the second arterial conduit. Finally, the authors discuss the complexity of the multiarterial grafting as a barrier for wider adoption, emphasizing that a fundamental change in our approach to teaching coronary bypass surgery should start during cardiac surgery residency training. We wholeheartedly agree that senior surgeons who have mastered the technique must teach residents when and how to perform a more complex operation safely.

These efforts will take many years to bear fruit. In the meantime, establishing multiarterial bypass as a quality metric may be the most effective driver of practice change within the purview of our surgical community. For example, use of multiarterial revascularization or documentation of contraindications in any patient aged less than 60 years could form one of the Society of Thoracic Surgeons quality measures. This could serve to guide referrals, raise awareness of the practice gap, and quantify the barriers to change. Irrespective, for the best possible results multiarterial revascularization should be performed by surgeons with frequent rather than occasional experience in the technique. As with any technically challenging operation, the repetition and development of a standard approach are the surest strategies for superior patient outcomes.

From the Department of Cardiac Surgery, Smidt Heart Institute, Cedars-Sinai Medical Center, Los Angeles, Calif.

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Address for reprints: Joanna Chikwe, MD, FRCS, Department of Cardiac Surgery, Smidt Heart Institute, Cedars-Sinai Medical Center, Beverly Hills, Los Angeles, CA (E-mail: Joanna.chikwe@cshs.org).

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## References


1. Vallely MP, Ramponi F, Seco M, Royse A. Multi-arterial grafting: why is it so hard to convince the masses of the benefits? *J Thorac Cardiovasc Surg*. 2021; 161:1832-6.
2. Gaudino M, Chikwe J, Falk V, et al. Transatlantic Editorial: The use of multiple arterial grafts for coronary revascularization in Europe and North America. *J Thorac Cardiovasc Surg*. 2020;159:2254-9.
3. Chikwe J, Sun E, Hannan EL. Outcomes of second arterial conduits in patients undergoing multivessel coronary artery bypass graft surgery. *J Am Coll Cardiol*. 2019;74:2238-48.
4. Gaudino M, Rahouma M, Habib RH, Hameed I, Robinson NB, Farrington WJ, et al. Practice patterns in coronary surgery in the United States: an analysis of the STS Adult Cardiac Surgery Database. *J Am Coll Cardiol*. 2020 [Epub ahead of print].
5. Taggart DP, Benedetto U, Gerry S, Altman DG, Gray AM, Lees B, et al; Arterial Revascular1zation Trial Investigators. Bilateral versus single internal-thoracic-artery grafts at 10 hears. *N Engl J Med*. 2019;380:437-46.
6. Gaudino M, Alexander JH, Bakaeen FG, Ballman K, Barili F, Calafiore AM, et al. Randomized comparison of the clinical outcome of single versus multiple arterial grafts: the ROMA trial-rationale and study protocol. *Eur J Cardiothorac Surg*. 2017;52:1031-40.