Upcoming expert opinions on adult coronary surgery

Leora B. Balsam, MD,^a and Mario Gaudino, MD^b

This year, readers will have access to a number of high-impact Invited Expert Opinion articles on important topics in coronary surgery ranging from the continued debate surrounding multiple arterial grafting (MAG) to the optimal use of graft flow measurement. In this era of rapidly evolving evidence across the field of coronary artery bypass grafting (CABG), experts will guide clinicians on everyday management and intraoperative decision making with the goal of improving patient care through an evidence-based approach.

MAG has seen a recent renaissance in cardiac surgery. Recently published randomized evidence has demonstrated superior long-term outcomes associated with MAG.^{1,2} Few have contributed more to the evolution of MAG than Stephen Fremes from the Sunnybrook Health Sciences Centre in Ontario, Canada. In the *JTCVS Open*, Fremes and colleagues³ expertly summarize the evidence supporting the use of MAG, particularly in patients with a long life expectancy.

Despite this wave of promising evidence, the use of MAG remains suboptimal.⁴ Gaudino, Kurlansky, and Fremes⁵ will discuss ways in which health care systems may disincentivize surgeons' use of MAG by focusing on short-term rather than long-term patient outcomes. In another article, Vallety and colleagues⁶ will directly address 3 major concerns related to MAG; namely, the lack of supportive randomized evidence given the neutral results of the Arterial Revascularization Trial, potential for increased morbidity and mortality, and the perceived increased technical complexity. Furthermore, Kurlansky⁷ will maintain that the answer to "should I use MAG?" is a resounding yes as he explains why further research is needed.

As the evidence surrounding MAG continues to develop, special concern has been turned toward specific patient populations who would benefit most from this grafting strategy, such as older individuals, female patients, and patients with important comorbid conditions like diabetes. Patients with diabetes, in particular, present

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CENTRAL MESSAGE

In upcoming issues of the *Journal*, readers will have access to a number of high-impact Invited Expert Opinion articles on important topics in coronary surgery.

a unique challenge to coronary surgeons. In their Invited Expert Opinion article, Akhrass and Bakaeen⁸ will summarize the pathophysiology and anatomy of coronary disease in patients with diabetes, delve into the literature related to the most appropriate revascularization strategy, and discusses the role of MAG.

Four leaders in the field of coronary artery disease distill the recently published results of the International Study of Comparative Health Effectiveness With Medical and Invasive Approaches (ISCHEMIA) trial⁹ and its implications on surgical myocardial revascularization in another Invited Expert Opinion article.¹⁰ The ISCHEMIA trial, which was designed to compare an initial conservative strategy with an initial revascularization strategy for stable ischemic heart disease, found similar outcomes in both groups at a median of 3.2 years of follow-up. The authors will explain how these findings do not negate the value of CABG in stable ischemic heart disease, but rather highlight the importance of including a medical therapy expert alongside surgeons and interventionalists in heart team discussions.¹⁰

Gaudino and Brophy¹¹ will help readers critically evaluate recent trials and meta-analyses on the management of severe left main coronary artery disease. They explain how differences in study design have led to discordant results on the merit of percutaneous coronary intervention (PCI) versus CABG, using the Evaluation of XIENCE Versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularization (EXCEL) and Percutaneous Coronary Angioplasty Versus Coronary Artery

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Received for publication March 8, 2021; revisions received March 8, 2021; accepted for publication March 12, 2021; available ahead of print April 20, 2021.

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J Thorac Cardiovasc Surg 2021;162:103-2

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2021.03.105>

Bypass Grafting in Treatment of Unprotected Left Main Stenosis (NOBLE) trials for management of low- and medium-complexity left main coronary artery disease as examples. Based on the totality of current evidence, they conclude that surgical management should be the standard of care.

The management of chronic coronary syndromes remains unclear. Doenst and Sigusch¹² will argue that CABG, compared with PCI, confers greater long-term benefits in these patients by not only revascularizing ischemic myocardium but also by preventing new infarctions through “surgical collateralization” of nonflow-limiting lesions. These are identified in more than 85% of subsequent infarctions, but are not typically addressed during PCI.¹² This explanation has important implications as it relates to modern coronary surgery and the use of MAG as well as fractional flow reserve (FFR).

FFR, in fact, may have a limited role in CABG. Glineur and colleagues¹³ from Ottawa Heart Institute present a summary of the evidence of FFR in CABG. FFR has demonstrated clear benefit in PCI, showing superiority versus angiographic-guided revascularization. Glineur and colleagues¹³ review why FFR is of limited applicability in CABG, a surgical strategy aimed not only at addressing acute ischemia, but also at preventing future events. They argue that FFR has utility in determining the type of graft to use (ie, arterial vs venous).¹³

Graft patency remains of paramount importance. Microvesicles in the circulation may play a role in graft thrombosis. In their Invited Expert Opinion article, Moore and Harken¹⁴ will suggest that an increase in microvesicles with tissue factor expression may explain the etiology of graft thrombosis in certain patients. The authors suggest that this pathway of thrombosis may offer specific, targeted therapies to prevent graft occlusion; however, further investigation is needed before clinical implementation.¹⁴

Looking forward, Ryan and colleagues¹⁵ from Baylor College of Medicine will offer a thoughtful review of therapeutic angiogenesis and direct cellular reprogramming. The authors highlight how both can address the current gap in therapeutic options that exist for patients with no-option refractory angina and heart failure due to severe coronary artery disease. Their review offers a compelling statement on the current state of preclinical trials in this arena, with the high potential for clinical translation.

Finally, 2 reviews in *JTCVS Techniques* offer readers insight into intraoperative strategies related to the radial artery (RA) and graft patency. Most of the data that led to the reintroduction of the RA in coronary surgery can be attributed to James Tatoulis and colleagues from Melbourne. In an upcoming review of RA harvesting and preservation strategies, Tatoulis and colleagues¹⁶ offer a pragmatic approach to make even the most unfamiliar

surgeon comfortable with using the RA in CABG. Additionally, as the use of intraoperative graft flow verification becomes more common, Akhrass and Bakaeen¹⁷ will encourage routine use with judicious interpretation to avoid unnecessary graft revision.

We are grateful to all of the authors for their important contributions and have no doubt that our readers will benefit from their expertise. These Invited Expert Opinions were solicited from widely published authors across coronary surgery and will help surgeons internationally make evidence-based, informed decisions to improve patient outcomes.

Conflict of Interest Statement

The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

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Key Words: CABG, coronary artery bypass, coronary surgery

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