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The Use of Intraoperative Transit Time Flow Measurement for Coronary Artery Bypass Surgery: Systematic Review of the Evidence and Expert Opinion Statements

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Abstract

Transit time flow measurement (TTFM) allows quality control in coronary artery bypass grafting but remains largely underused, probably because of limited information and the lack of standardization. We performed a systematic review of the evidence on TTFM and other methods for quality control in coronary artery bypass grafting following PRISMA standards and elaborated expert recommendations by using a structured process. A panel of 19 experts took part in the consensus process

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experts took part in the consensus process using a 3-step modified Delphi method that consisted of 2 rounds of electronic voting and a final face-to-face virtual meeting. Eighty percent agreement was required for acceptance of the statements. A 2-level scale (strong, moderate) was used to grade the statements based on the perceived likelihood of a clinical benefit.

The existing evidence supports an association between TTFM readings and graft patency and postoperative clinical outcomes, although there is high methodological heterogeneity among the published series. The evidence is more robust for arterial, rather than venous, grafts and for grafts to the left anterior descending artery. Although TTFM use increases the duration and the cost of surgery, there are no data to quantify this effect. Based on the systematic review, 10 expert statements for TTFM use in clinical practice were formulated. Six were approved at the first round of voting, 3 at the second round, and 1 at the virtual meeting.

In conclusion, although TTFM use may increase the costs and duration of the procedure and requires a learning curve, its cost/benefit ratio seems largely favorable, in view of the potential clinical consequences of graft dysfunction. These consensus statements will help to standardize the use of TTFM in clinical practice and provide guidance in clinical decision-making.

Footnotes

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The opinions expressed in this article are not necessarily those of the editors or of the American Heart Association.

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