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Commentary: The original pandemic—stemming the tide of overweight, diabetes, hypertension, and dyslipidemia after coronary artery bypass grafting

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Overweight and abdominal obesity in the absence of excess total body weight have been shown to be associated with insulin resistance, which results in hyperinsulinemia, hyperglycemia, and release of adipocyte cytokines. This constellation leads to vascular endothelial dysfunction, inflammation, dyslipidemia, and hypertension—a clinical phenotype and cluster of risk factors for atherosclerotic cardiovascular disease that have been described as the “metabolic syndrome.”¹

In this edition of the *Journal*, Deo and colleagues² report on outcomes after coronary artery bypass grafting (CABG) in patients with metabolic syndrome. Of 9615 patients undergoing isolated CABG at 41 Veterans Affairs hospitals over a 10-year period, a large number had comorbidities commonly found in patients with metabolic syndrome, including overweight (32%), diabetes (44%), hypertension (93%), and dyslipidemia (34%). For the analysis, patients with 3 or more of those characteristics were considered to have metabolic syndrome and compared with those with 2 or less of these comorbidities for a median follow-up time of 6.5 years. The authors report that the prevalence of metabolic syndrome as defined increased over the study time period and was associated with equal short- and longer-

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CENTRAL MESSAGE

Lifestyle modification and compliance with guideline-directed medical therapy through a multidisciplinary team approach are key to improved long-term survival in patients with metabolic syndrome who undergo CABG.

term all-cause mortality between the 2 groups. The equivalent survival is somewhat surprising because all these comorbidities are established risk factors for increased morbidity and mortality in isolation, and there is no plausible reason why this would change when they are part of the metabolic syndrome. Should we not be concerned about patients presenting with the metabolic syndrome and how it affects outcomes after CABG? Perhaps, the best answer is: It depends. Considerable controversy exists whether the described clinical phenotype is an actual syndrome and confers risk beyond its individual components (obesity, diabetes, hypertension, dyslipidemia).³ This issue is further complicated when studies are subject to information loss, misclassification, residual confounding, and biased estimates due to dichotomization of variables. Obesity, diabetes, hypertension, and dyslipidemia are not binary, and the composite of them certainly is not. This may be the most likely explanation why Deo and colleagues² were not able to show a difference in operative or longer-term mortality. Furthermore, veterans have a higher prevalence of substance abuse, hepatitis, and mental health issues, all of which affect both the exposure and the outcomes reported in this study.^{4,5}

The prevalence of obesity, diabetes, hypertension, and dyslipidemia as cardiovascular risk factors was high in

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this study cohort overall. This is reflected in the reported unfavorable long-term survival after CABG of 80% and 48% at 5 and 10 years, respectively. The authors also demonstrate that having more, compared with fewer, of the 4 risk factors is associated with an increased risk of myocardial infarction and readmission for congestive heart failure over time. This emphasizes a critical although indirect takeaway from this study: CABG is not a treatment for atherosclerosis and a somewhat meaningless intervention in absence of aggressive lifestyle risk modification, guideline-directed medical treatment, and patient compliance. These aspects are critical to ensure high-quality outcomes early and late after CABG, and therefore part of the Society of Thoracic Surgeons Star Rating and other quality metrics. They are also key to ensure the well-documented survival benefit of CABG over percutaneous coronary intervention,⁶ and although both revascularization strategies are associated with poor guideline-directed medical therapy compliance, guideline-directed medical therapy after CABG is in particular need of improvement.⁷

The authors bring our attention to an important aspect of cardiac surgery, and we commend them on their study of the

complex interaction between highly prevalent risk factors of atherosclerosis and CABG in a vulnerable population.

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Commentary: Has revascularization MET its match?

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Metabolic syndrome (MET), or Syndrome X, encompasses a group of patients with comorbidities (obesity, insulin resistance, dyslipidemia, hypertension) who are at

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CENTRAL MESSAGE

Innovative therapies need to be developed for patients with metabolic syndrome (MET) after revascularization procedures (PCI or CABG), as long-term outcomes have not improved.

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