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method recently developed by Savage's colleagues at the Cleveland Clinic.³

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IS MORE ALWAYS BETTER IN STERNAL CLOSURE?

Reply to the Editor:

Wire cerclage remains the most common method of sternal closure. The literature describes different configurations for sternal closures with wires.¹ Savage highlights an important question regarding the randomized clinical trial in which Allen and colleagues² compared rigid plate fixation with wire cerclage.² The question posed by Savage is fundamental in the evaluation of novel technologies for adoption in health care systems. The foundation of all economic evaluations requires that the new intervention be compared with the appropriate standard of care.

In the study by Allen and colleagues,² surgeon discretion dictated how many wires were placed, with the minimum being 6. This is a pragmatic approach to

conducting a clinical trial and allows generalizability of findings of this study. Savage, however, purports that at least 8 wires are required in high-risk patients according to findings from a previous retrospective observational analysis of 4466 patients undergoing cardiac surgery.³ This study found that in selected high-risk groups, sternal complications were lower in patients who received at least 7 or at least 8 wires relative to those who received less than 7 or 8 wires, respectively. There was no difference between those who received more or less than 9 wires. The results from this study were interesting. Patients with diabetes (as a lone risk factor) who received 8 or more wires had fewer sternal complications than those who received less than 8 wires. When patients with diabetes and an additional risk factor (chronic obstructive pulmonary disease or renal failure) were compared with less than 8 or 8 or more wires, however, there was no difference in sternal complications between the groups. Patients with very high risk features were excluded from the study of Allen and colleagues.² In a prospective study by Schimmer and associates⁴ comparing conventional wire cerclage (≥ 6 wires) with the Robicsek method (ie, additional lateral reinforcement in addition to standard wire cerclage closure) in high-risk patients (those with at least 1 risk factor for sternal complication), there was no difference in sternal complication rates between the treatment arms. In a retrospective cost-comparison study by Park and colleagues⁵ of 75 high-risk patients who received either rigid plate fixation or a modified wire technique (either Robicsek or wire cerclage in figures-of-eight), crude rates of sternal complications were higher in the wire cerclage group than in the plating group. The optimal number of wires and the optimal technique used for closure, even in high-risk patients, thus remain uncertain and controversial.

Savage brings up an important point regarding the conduct of economic evaluations, from which perspective costs should be measured and compared. In the analysis of Allen and colleagues² analysis, they compared hospital costs at discharge and at 6 months. Savage highlights that the high acquisition costs of plates are an immediate burden to hospitals, whereas the overall health care system may reap the potential benefits in longer term cost savings through reduction in readmission events. Choosing the correct perspective (hospital vs third-party payer, eg, Medicare) is important; in an era in which institutions are reimbursed in a bundled payment scheme, hospital budgets are no longer “siloes” between departments. Most health technology assessment guidelines would recommend the perspective of the third-party payer (often the public payer), and this would represent the total costs to the entire health care system.⁶ To address the topic of cost-effectiveness fully, a cost-utility analysis incorporating both differences

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in cost and quality of life outcomes between rigid plate fixation and the appropriate standard of care is needed. Whether that appropriate standard of care is 6, 7, 8, or 9 wires remains to be determined. As Kamiya and coworkers³ and Schimmer and associates⁴ have demonstrated, more may not always be better.

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