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EFFECTS OF BLOOD TRANSFUSIONS ON TRANSCATHETER AORTIC VALVE REPLACEMENT OUTCOMES

To the Editor:

Kolte and colleagues¹ report the results of a propensity score-matched study of hospitalizations for transcatheter aortic valve replacement in the National Inpatient Sample that matched hospitalizations with red blood cell (RBC) transfusions with hospitalizations without transfusions. They used *International Classification of Diseases, Ninth Revision* procedure codes to identify transfusions, and they cited 26.4% to 83% sensitivity and 97.5% to 100% specificity for these procedure codes.

Of the numbers provided for sensitivity, the high end (83%) derives from a single-center case-control study of 716 records.² Other studies of varying sizes report much lower values, as described by Kolte and colleagues.¹ A more recent study by Howard and colleagues,³ which validated billing records of 12,091 patients in 53 community hospitals, refined these numbers, describing 71.6% sensitivity and 92.6% specificity.³

In addition, Kolte and colleagues¹ identified a 17.3% transfusion rate in the transcatheter aortic valve replacement records from the National Inpatient Sample. Data from the Society of Thoracic Surgeons and American College of Cardiology Transcatheter Valve Therapy registry⁴ demonstrate an overall transfusion rate of 30.1% during the same period (2012-2015) studied by Kolte and colleagues.¹ Together, these figures suggest a systemic undercoding of transfusions in the National Inpatient Sample, which introduces a substantial degree of unreliability into the process of propensity score matching.

Kolte and colleagues¹ describe an undeniably important trend in the perioperative management of patients undergoing transcatheter aortic valve replacement: a decline in hospitalizations requiring RBC transfusion,

which is a worthy effort known to be associated with reduced complications and improved outcomes in cardiac surgery.⁵ Uncertainty regarding the validity of the *International Classification of Diseases, Ninth Revision* coding for RBC transfusion, however, highlights the potential weakness of administrative database use for clinical research into secondary procedures and diagnoses.

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REPLY: ANALYSIS OF ADMINISTRATIVE CLAIMS DATA PROVIDES VALID AND MEANINGFUL CONCLUSIONS DESPITE ITS IMPERFECTIONS

Reply to the Editor:

We thank Mullan and colleagues¹ for their interest in our article.² They question the validity of the *International Classification of Diseases, Ninth Edition, Clinical Modification (ICD-9-CM)* procedure codes for red blood cell (RBC) transfusion and reference the study by Howard and associates,³ which demonstrated a sensitivity of 71.6% (95% confidence interval, 60.4%-82.8%) and a specificity of 92.6% (95% confidence interval, 88.3%-97.0%) of *ICD-9-CM* codes for measuring transfusion. A key finding of that study, however, was that when 9 (out of 69) hospitals with claims-based transfusion rates of less than 10% were excluded, the sensitivity rates improved to 80.7% (95% confidence interval, 74.4%-87.1%).³ The modesty of the overall sensitivity of billing codes for transfusion is thus due to nonreporting or

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