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Risk Adjusted Mortality Ratings and Public Reporting for High-Risk PCI

We appreciate the perspective of the comments by Drs. Miner and Nield (1) regarding our study (2). As noted by Drs. Miner and Nield (1), there are many limitations to any form of observational risk-adjusted outcomes comparisons. Certainly cardiac arrest or shock patients have a gradient of risk, and certainly providers may have a gradient in who they take to the lab or how they classify and report "high risk." In individual cases, a provider could overcall shock in a lower-risk case and thereby have better observed results than expected. However, the American College of Cardiology-NCDR (National Cardiovascular Data Registry) risk models were developed from real-world data. As such, provider-related factors would have already been incorporated into the models. Thus, such variation in community practice is unlikely to explain why, in aggregate, providers who take on more high-risk cases do better. More importantly, in our analyses of the "concentrated risk year," we used the individual providers themselves as their own control group. We found in such high-risk scenarios, providers' "risk-adjusted" outcome performance was as good or better in high-risk cases than when the provider faced normal-risk or low-risk groups. So, we believe our paper provides compelling evidence that, in aggregate, the NCDR percutaneous coronary intervention risk models adequately assess and compensate providers for taking high-risk cases to the lab.

However, Miner and Nield (1) also raise an important point regarding whether or not public reporting itself is harmful or helpful. To be clear, our paper should not be seen as an endorsement of public reporting, and we agree the assessment of the total impact of public reporting is complex. On the one hand, public reporting does provide consumers with information on provider outcomes as well as give providers an incentive to monitor and hopefully improve their procedural outcomes. Although there is much debate whether consumer choice is improved via public reporting, there has been consistent evidence supporting the value of performance measurement and subsequent provider-led quality improvement, including door-to-balloon times, as well as with the outcomes of acute myocardial infarction, heart failure (3), and stroke (4). On the other hand, public outcome reporting could make certain providers "gun shy" and unwilling to take high-risk cases to the lab, even in situations where revascularization may be beneficial (such as ST-segment elevation myocardial infarction or shock). Previous studies have indicated that states with public reporting use PCI less and perhaps have worse outcomes than do states without (5). However, these studies were the exact motivation for our paper. Risk-averse clinician behavior likely represents the provider's fear that taking on high-risk cases will "hurt"

their performance ratings relative to peers. Our data demonstrate that such fears appear unfounded.

In conclusion, although one can debate the impacts of public reporting, our study should be interpreted to say that if it is undertaken, current modeling methods are generally adequate to capture and adjust for case mix and risk and thereby avoid penalizing clinicians who take on high-risk patients. We hope such information encourages providers to think more about the outcomes of their high-risk patients than about the impact of these on their procedural report card results.

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Uncertain Detection of Nonuniform Scaffold Expansion Patterns Using Optical Coherence Tomography

We read with interest the paper by Ohno et al. (1) and found that their conclusions merit a few comments. Longitudinal nonuniform expansion patterns by the ABSORB bioresorbable scaffold (BVS) (Abbott Vascular, Irvine, California) may be of clinical importance, but the use of optical coherence tomography (OCT) to identify such patterns requires methods that take catheter motion artifacts into account. The variation in length measurements by OCT compared with nominal length has been reported in ABSORB BVS-treated patients with differences of as much as 5.2 mm (2) and as much as 10 mm in metal stent-treated patients (3), although stent independent. The OCT-evaluated lengths also showed variation within the same scaffold at different time points (2), indicating that OCT may not be appropriate as a criterion standard for intravascular length measurements. Variation in length occurs in subsegments and may cause visible motion artifacts of elongation and compression at each heartbeat. Faster pullback systems (36 mm/s, OPTIS Integrated System, St. Jude Medical, St. Paul, Minnesota; 40 mm/s, LUNAWAVE, Terumo, Tokyo, Japan) reduce the impact of motion artifacts (4), and a prototype system enabling long pullbacks at 100 mm/s "in one heartbeat" has been reported (5).

The 3-dimensional (3D) OCT reconstructions shown by Ohno et al. might call for a different interpretation because the "elongated" scaffold (**Figure 1D**) actually looks partially longitudinally *compressed*, also when compared with the "normal" scaffold (**Figure 1H**). Further, the struts of the BVS in **Figure 1D** in both ends seem affected by fracture, motion artifacts, or an oblique imaging wire position. To rule out catheter motion artifacts as the explanation of potential scaffold compression or elongation, it is advisable to compare 3D OCT reconstructions of at least 2 subsequent pullbacks of the same section.

The reported finding of differences in strut thickness may call for a more systematic workup because a mean strut thickness reduction of 15 μm (9.6%) by the suggested length increase of 2.6 mm (14.4%) is questionable. When deployed, the scaffold adapts to the vessel wall by changing angulations within the sinusoidal hoops and connectors, and because the hoops in **Figure 1D** are not straightened fully by dilation or drag from the connectors, a substantial reduction in thickness due to elongation of the scaffold is unlikely. If the reduction in strut thickness is real, struts in the hoops might have been stretched locally by the higher deployment pressure, but this is still uncertain because the hoops are not fully extended in the 3D reconstruction. Although not previously reported, struts might also have been squeezed by the higher deployment pressure, but subtle production differences between the 2 sizes of the ABSORB scaffold might also have caused a potential difference in strut thickness. However, explanations may also