

Table 1-continued		
Risk factor	Adjusted risk estimation – OR (95% CI)	Reference
Blood glucose > 11 mmol/L	2.68 (1.38–5.22)	Leekha <i>et al.</i> ⁴
Peak glucose >180 mg/dL or > 10 mmol/L	1.99 (1.53–2.57)	Davis <i>et al.</i> ³
Hyponatremia <134 g/dL	1.1 (1.0–1.2)	Brothers <i>et al.</i> ⁵
Post-operative immobilisation	1.20 (1.02–1.42)	Greenblatt <i>et al.</i> ²
Major amputation	12 (4.1–34)	Brothers <i>et al.</i> ⁵
Prior revascularisation	2.68 (1.38–5.22)	Leekha <i>et al.</i> ⁴
	1.57 (1.04–2.38)	Davis <i>et al.</i> ³

OR = odds ratio; CI = confidence interval; BMI = body mass index; COPD = chronic obstructive pulmonary disease; CLI = critical limb ischaemia.

are different from those shown in the cited references (Table 1), and that some other risk factors were not reported.

We would like to ask authors how they achieved these results and what the criteria were for selecting risk factors.

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*Note from the Editors

As a consequence of the inquiry by Tresson *et al.*,¹ the authors of the *ESVS 2020 Clinical Practice Guidelines on the Management of Vascular Graft and Endograft Infections* have published a Corrigendum.²

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Re “Biomechanical Assessment Predicts Aneurysm Related Events in Patients with Abdominal Aortic Aneurysm”

We are very pleased that methodology developed at our Intelligent Systems for Medicine Laboratory has been used in an extensive study of abdominal aortic aneurysm (AAA) biomechanics published in the *European Journal of Vascular and Endovascular Surgery*.¹ However, we feel obliged to point out a few limitations of our methodology, the understanding of which is necessary to interpret the results of Doyle *et al.*¹ properly.

The software for the biomechanical analysis of AAA (BioPARR) does not have any special functionality for AAA wall segmentation and thickness measurement. As our parametric studies showed an approximately linear relationship between measured/assumed wall thickness and computed maximum principal stress,² the inaccuracies in wall thickness measurements directly translate to imprecision in principal wall stress computation. Based on information about magnetic resonance image resolution,¹ we estimate a principal stress inaccuracy of $\pm 30\%$.

The version of BioPARR used in the study by Doyle *et al.*¹ does not account for the presence of residual stress. Using the current, freely available version of BioPARR (<https://bioparr.mech.uwa.edu.au/>), accounting for the presence of residual stress, we showed that its inclusion changes stress distributions significantly.³

The evaluation of the results published by Doyle *et al.*¹ is not truly patient specific as it uses population based statistics for estimation of the wall strength.

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Response to “Re Biomechanical Assessment Predicts Aneurysm Related Events in Patients with Abdominal Aortic Aneurysm”

We thank Miller *et al.* for their interest in our recent publication.¹ Indeed, it was always the intention to test the developed methods^{2,3} in the MA³RS Cohort,⁴ with our analyses beginning in 2017.

In response to the three points raised: (1) magnetic resonance imaging is often used to measure aortic wall thickness, with good repeatability reported.^{5–7} We found mean wall thickness measurements to differ by $\pm 12\%$ between three users. This equates to a 6% difference in maximum principal stress and $<5\%$ difference in peak aneurysm biomechanical ratio (ABR). (2) Including residual stress into wall stress simulations typically reduces the magnitude of the maximum principal stress. Therefore, all cases would have lower wall stress and lower ABR. It is unlikely that this would change the conclusions of the paper. We finalised our methods and began the ABR computation before Miller *et al.* published their residual stress approach in 2018.⁸ Furthermore, their publication does not state that the method is included in new releases of BioPARR. (3) One could argue that no model is truly “patient specific” as assumptions are almost always required. We followed the common use of the term “patient specific” in abdominal aortic aneurysm (AAA) studies whereby the aneurysm geometry (including wall thickness in our work) and pressure loading are patient specific. Also, the wall strength model uses geometric information (local ratio of diameter; local thickness of thrombus), gender, and family history,⁹ all of which are unique to that patient, to generate the pointwise strength data. Interestingly, Miller *et al.* refer to their AAA simulations as “patient specific”,^{9,10} despite

using only simplified uniform wall thickness AAA geometries and blood pressure loading, which are less patient specific data than those used in the models of Doyle *et al.*¹

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Re “The Elephant in the Operating Room”

I read the work by Massiot *et al.*¹ and the commentary by Gonçalves and Chakfé² with great interest. Technology has provided us with high resolution imaging equipment allowing us to perform demanding procedures at a fraction of the exposure of older devices. In most centres, low dose protocols and radiation safety training are already in place. However,