

Reply to: “Letter to the editor: Comparing pace and speed in the pulmonary circulation?”

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REPLY: We thank Weir-McCall and colleagues (2) for identifying the typographical error in the equation for wave speed in our appendix (1). Unfortunately the Q and A were inverted in the text. The equation based on energy minimization in the appendix should rather read:

$$c = \sqrt{\frac{\sum dQ^2}{\sum dA^2}}$$

which does result in wave speed in m/s. However, the correct equation was used in processing of the data in the article (Fig. 1A). In fact, if we had calculated “pace,” a significant bias would be seen, as shown in Fig. 1B.

Weir-McCall rightly draws attention to the difficulty of measuring pulse wave velocity (PWV) in the pulmonary circulation and the relatively wide limits of agreement between the two methods described in the appendix of this study. Unfortunately, there is no noninvasive reference standard method of assessing PWV in the pulmonary circulation. We compared our “three-point Q/A method” of assessing PWV with an alternative energy minimization technique to exclude large biases. The minimal bias suggests that there is no systematic difference between these two techniques. However, the energy minimization technique was developed for the coronary

circulation, where it is not possible to calculate the PWV using the Q/A method. We believe that in the pulmonary circulation the Q/A method is more valid, which may account for the relatively wide limits of agreement. However, we agree that more work is required in validating these metrics and one possibility is through the use of in silico models.

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DISCLOSURES

No conflicts of interest, financial or otherwise, are declared by the author(s).

AUTHOR CONTRIBUTIONS

M.A.Q. prepared figure; M.A.Q. and V.M. drafted manuscript; M.A.Q., P.S., and V.M. edited and revised manuscript; M.A.Q. and V.M. approved final version of manuscript.

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2. Jonathan R. Weir-McCall JR, Struthers AD, Lipworth BJ, and Houston JG. Letter to the editor: Comparing pace and speed in the pulmonary circulation? *Am J Physiol Heart Circ Physiol* 310: H0–H0, 2016. doi:10.1152/ajpheart.00065.2016.

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Fig. 1. A: original figure comparing pulse wave velocity (PWV) (Q/A method) with the energy minimization technique. B: Bland Altman comparing PWV (Q/A method) with “pace” based upon the typographical error equation.

