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Letter to the Editor on "Traditional Cardiovascular Risk Factors Strongly Underestimate the 5-Year Occurrence of Cardiovascular Morbidity and Mortality in Spinal Cord Injured Individuals"

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DEPARTMENTS

Letters to the Editor

**Letter to the Editor on
"Traditional
Cardiovascular Risk
Factors Strongly
Underestimate the
5-Year Occurrence of
Cardiovascular
Morbidity and
Mortality in Spinal Cord
Injured Individuals"**

Barton et al's¹ article studies cardiovascular risk in a cohort of individuals with a spinal cord injury. As the authors noted, the Framingham Risk Score (FRS) was derived to identify risk factors for cardiovascular disease. It is important to note, however, that the outcome measure for this risk score is defined as a "composite of coronary heart disease (coronary death, myocardial infarction, coronary insufficiency, and angina), cerebrovascular events (including ischemic stroke, hemorrhagic stroke, and transient ischemic attack), peripheral artery disease (intermittent claudication), and heart failure."^{2(p744)} This composite outcome does not include pulmonary embolism, chronic venous insufficiency, deep venous thrombosis, atrial fibrillation/flutter, aortic aneurysms, valve diseases, or dissection, as was used in Barton et al's study. These other outcomes, which are not meant to be predicted by the FRS, encompassed 22 of the 39 outcomes that were reported. Additionally, there were 7 deaths in this study from "other cardiovascular death" and it is unclear whether the etiology of these would fall with the composite outcome for the FRS. There were also 2 instances of peripheral vascular disease, an entity that includes, but is not specific to, peripheral artery disease, so it is unclear whether these outcomes fall within the FRS composite outcome.

There were 8 events (1 transient ischemic attack, 5 myocardial infarctions, 2 with angina) that do fall within in the FRS composite outcome. From the summary of the statistical analysis, it is not evident whether 8 events exceed what FRS would predict for this group. It would be informative if the authors could provide more analysis in this regard. It would also be informative to know whether the FRS retained its predictive utility for this smaller set of outcomes.

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Disclosures: none.

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1. Barton TJ, Low DA, Bakker EA, et al. Traditional cardiovascular risk factors strongly underestimate the 5-year occurrence of cardiovascular morbidity and mortality in spinal cord injured individuals. *Arch Phys Med Rehabil* 2021;102:27–34.
2. D'Agostino Sr RB, Vasan RS, Pencina MJ, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. *Circulation* 2008;117:743–53.

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Response to Letter to the Editor on “Traditional Cardiovascular Risk Factors Strongly Underestimate the 5-Year Occurrence of Cardiovascular Morbidity and Mortality in Spinal Cord Injured Individuals”

We thank the authors for their interest in our recent paper.¹ In their letter, the authors expressed concern at the inclusion of certain endpoints (pulmonary embolism, chronic venous insufficiency, deep venous thrombosis, peripheral vascular disease, atrial fibrillation/flutter, or aortic aneurysms, valve diseases or dissection, and “other cardiovascular death”), because the Framingham Risk Score (FRS) prediction model was originally not set up to predict these endpoints.² For this purpose, we repeated our analysis with 8 events (1 transient ischemic attack, 5 myocardial infarctions, 2 with angina) that fall within the FRS endpoints, as specifically defined by D’Agostino et al.² Including these 8 events only, we found a borderline significant difference in clinical outcomes between individuals with a less than median FRS (eg, low risk) vs a greater than median FRS (high risk) with a risk ratio for clinical outcomes of 6.3 (95% confidence interval, 0.76–52.42; $P=0.088$). Seven of the 8 cardiovascular disease events were recorded in the high FRS group. In addition, when the predictive value of the FRS

alone was assessed by receiver operating characteristic curves, the area under the curve was 0.76 (95% confidence interval, 0.63–0.89). Overall, these additional subgroup analyses reinforce our original analyses, albeit caution must be noted because of the low number of events, which means the analyses are rather underpowered. This provided additional support for the observation of a remarkably high incidence of cardiovascular disease events in individuals with spinal cord injury^{3,4} but also highlights the need to address these health issues in this group in future (pre)clinical work.

Disclosures: none.

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Bilateral vs Unilateral Arm Training for Patients With Stroke

We read with great interest the study by Renner et al,¹ which compared arm cycle–based unilateral and bilateral arm training in patients with stroke who have severe upper limb paresis. The study concluded that both of the interventions improved upper limb function after training, and bilateral arm training showed significant functional improvement in patients with pure subcortical stroke. To our knowledge, this is the first randomized controlled trial that investigates the relationship between lesion location and the efficacy of arm training, and we appreciate the author's contribution. However, we would like to respectfully raise a few queries regarding their findings.

We noticed that in the study, the spasticity in the cortical lesion group significantly increased after bilateral arm training. We are curious about whether this finding is attributed to the natural course of stroke or the effect of bilateral arm training. The Modified Ashworth Scale (MAS), indicating the severity of spasticity, is an ordinal scale instead of an interval scale. Therefore, the MAS, expressed by means and SDs in the study, might be inappropriate and potentially contribute to incorrect results. In addition, although the results showed no difference in upper limb function in the cortical lesion group after training, the increase in spasticity after bilateral arm training might interfere with upper limb function. This might attenuate the effects of bilateral arm training. In this regard, a description on how spasticity influences upper limb function after training should have been provided by the authors.

We believe that unilateral arm training might be more beneficial than bilateral arm training. In patients with stroke, the lesion-side cortex usually loses its ability to inhibit the contralateral motor cortex, whereas the sound-side cortex still possesses its ability to inhibit the lesion-side cortex.² The relative increase in the inhibition of the lesion-side cortex might hinder motor recovery after stroke. Therefore, the recovery of motor function after stroke can be achieved by reducing transcallosal inhibition from the sound side. Studies have shown that inhibition of the activation of the sound-side cortex occurs when patients receive constraint-