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Response to: “Motoric Subtypes of Delirium: Not associated with Long-Term Outcomes in Adults After Critical Illness?”

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We thank Gao et al (1) for their insightful comments on our recently published study (2). Our work examining long term mental health outcomes in survivors of critical illness included both a veteran and civilian population. We agree with their comments regarding evidence that co-morbid Post-Traumatic Stress Disorder (PTSD) is higher in war veterans and more so in those with mild traumatic brain injury. We chose to combine the two similarly designed cohorts to increase power, and we adjusted for enrollment site of Veterans Affairs versus civilian hospital in all analyses to account for these potential differences. Thus, our findings regarding the association of motoric subtype of delirium with outcomes should be independent of veteran vs. civilian effects. Regarding the concern about higher rates of PTSD associated with the long-term effects of traumatic brain injury, the parent studies excluded any patient with traumatic brain injury, major stroke, or significant baseline cognitive impairment (3).

The second point raised by Gao et al (1) addresses our choice to omit the mixed motoric subtype of delirium in analyses. Hyperactive delirium is consistently reported at markedly lower rates than hypoactive or mixed (combined hyperactive and hypoactive) delirium. Rates of hyperactive only delirium in the ICU range from as little as 1.6% (4) to 11% in the study cited by van den Boogaard and colleagues (5). Drawing conclusions about the etiology and impact of the hyperactive subtype is challenging, and this is in part due to including patients with signs of hyperactive delirium into the mixed delirium classification. The contribution of the hyperactive subtype to outcomes remains poorly understood, and it is unclear whether the effects of either the hypoactive or hyperactive subtype may have a stronger influence on the outcomes of the mixed subtype group. We, therefore, sought to maximize granularity of the data by evaluating each episode of delirium individually to more fully account for the distinct effects of hyperactive delirium. Further, we included an interaction term between hypoactive and hyperactive delirium that was not found to be significant and removed from the final model.

Finally, the comment regarding the difference in outcomes between our study and that of van den Boogaard and colleagues raises an interesting point about tools used to assess

long-term, patient centered outcomes. The study cited found that patients with hypoactive delirium had lower mental health scores on the Short Form-36, a self-reported survey that assesses quality of life. Thus, patients with hypoactive delirium subjectively felt their mental health was worse after critical illness than their counterparts with hyperactive or mixed type delirium. Our study used validated measures of functional status (Katz Activities of Daily Living and the Functional Assessment Questionnaire for Instrumental Activities of Daily Living), depression (Beck Depression Inventory-II), and PTSD (PTSD Checklist-Specific) but did not assess self-reported quality of life. Thus, we cannot compare the experience and quality of life of our patients to that in the van den Boogaard cohort. Notably, the differences between the subtypes were only on the mental health component of the SF-36, whereas no difference in physical function scores were found. This discussion further supports the need for investigations into mechanisms driving the different motoric subtypes and the long-term recovery trajectory of patients with differing motoric subtypes of delirium.

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