Reviewer's report

Title: Visual pursuit response in the severe disorder of consciousness: modulation by the central autonomic system and a predictive model.

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Reviewer: Lorina Naci

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The manuscript by Riganello et al. provides an important and very interesting set of results that link the occurrence of visual pursuit with the balance between the function of sympathetic and parasympathetic nervous systems, in particular a patient’s autonomic functional state that is observed through measures of heart rate variability.

The presence of visual pursuit in any given patient with disorders of consciousness is deemed indicative of (minimal) awareness, and, potentially, a sign of the patient’s functional recuperation. Indeed, its presence can warrant upgrading the patient’s clinical diagnosis from vegetative state to minimally conscious. It is well established that these patients’ arousal and vigilance varies between different testing sessions, and, consequently, so does their ability to perform well in behavioral assessments, which determine their clinical diagnosis.

These results provide a better understanding of how the presence of visual pursuit varies with the functional state of the patient. They provide objective and tractable indicators of its variability, which are useful for reliably testing visual pursuit.

Discretionary Revisions
I would recommend careful editing of the paper to improve the quality of written English, before publishing. Several sentences are hard to parse, as, for example, towards the end of the Discussion section (see sentence starting with "residual circadian/ultradian...")

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests