**Supplementary Materials**

 **Methods**

*DCAT*

The DCAT consists of six tests: motor speed and control, span of attentional field, spatial judgement and decision making, speed of attentional shifting, executive function, and identification of hazardous driving situations. The scores are combined using an algorithm determined through regression analyses to provide the strongest predictor of Road Test (DORE) outcomes. The DCAT outcome measure is the predicted probability of failing the DORE with cut-points of pass (<0.30), indeterminate (0.30-0.70), and fail (≥ 0.71) [25].

*DORE*

The DORE is a riving evaluation given in a dual-brake car over a standardized route. The route was defined to emphasize the driving manoeuvres and situations that distinguish cognitively compromised, unsafe drivers from cognitively competent, safe drivers [24]. The driving evaluation is based on errors that cognitively impaired drivers make (competency-defining errors) that are different, either in terms of the type of errors or the frequency and severity, from those of healthy normal drivers on the standardized driving test as shown by research [25].

*SIMARD MD*

The SIMARD MD was developed and validated against on-road driving performance (e.g., outcomes from the DORE of the DriveABLE™ Assessment). To assist physicians in decision making, cut-points for the SIMARD MD were derived by identifying those most at-risk for failing an on-road assessment, those most likely to pass an on-road assessment, and those scoring in the indeterminate range. Based on the original research and validated in a second study, scores ≤30 on the SIMARD MD are predictive of unsafe driving performance, scores >70 are predictive of safe driving performance, and scores of 31–70 considered as indeterminate, with an on-road assessment needed for determination of driving competency.

*PHES*

The PHES is the sum score achieved from the five sub-tests of the Portosystemic Encephalopathy Syndrome test [27]. This paper- and pencil-based battery takes less than 20 minutes to administer and assesses psychomotor speed and precision, visual perception, visuo-spatial orientation, visual construction, concentration, attention and memory [27]. The PHES is considered the current ‘gold standard’ for the psychometric evaluation of patients with HE [1].

*EncephalApp Stroop Test*

The Stroop task is a test of psychomotor speed, cognitive flexibility, and evaluates resistance to interference. The EncephalApp Stroop Test has an ‘Off’ and ‘On’ state. The specific outcomes obtained at the end of the EncephalApp Stroop Test include: total time for five correct runs in the ‘Off’ state (OffTime), number of runs needed to complete the five correct ‘Off’ runs, total time for five correct runs in the ‘On’ state (OnTime), and number of runs needed to complete the five correct ‘On’ runs [28].The measure OffTime+OnTime has been found to be the best discriminator between subjects with and without MHE [2].

*Normative Data*

Normative data for the PHES and EncephalApp Stroop Test were obtained from testing calculators presented on the EncephalApp Stroop Test website ([www.encephalapp.com](http://www.encephalapp.com)). These norms were developed through a multi-center study performed in four United States-based centers (Virginia Commonwealth University, Richmond VA Medical Center, University of Arkansas, and the Cleveland Clinic) [28].The norms, based on healthy controls from the each of the centers, were adjusted with respect to age, gender, and years of education for all three tests and abnormal values [28].