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### Neurobehavioral Rating Scale – Revised

The Neurobehavioral Rating Scale-Revised (NRS-R) is a 29 item, multidimensional, clinician-based assessment instrument designed to measure neurobehavioral disturbances. The NRS-R is administered through a brief structured interview requiring 15–20 minutes to complete. The NRS-R includes assessment of orientation and memory for recent events, questions regarding emotional state, postconcussional symptoms, focused attention and concentration, explanation of proverbs, tasks of planning and mental flexibility, and delayed recall of objects presented at the beginning of a session. Observations are made regarding the patient's fatigability, visible signs of anxiety, disinhibition, agitation, hostility, difficulties in expressive and receptive communication, and disturbance of mood. In two recent clinical trials for severe traumatic brain injury (TBI; National Acute Brain Injury Study: Hypothermia—NABISH 1 and 2), the completion rate of the NRS-R was higher than that of a *brief* neuropsychological assessment for patients at 6 months postinjury (74.9% - 86.7% for NRS-R vs. 57.5% for neuropsychological battery); completion rate for the NRS-R at 3 months postinjury was 58.8% - 78.1%. Exploratory factor analyses of NRS-R in patients with severe TBI suggest a 5 factor model including: (1) executive/cognition, (2) positive symptoms, (3) negative symptoms, (4) mood/affect, and (5) oral/motor. These factors demonstrated acceptable internal consistency (Cronbach's coefficient alpha = 0.62 to 0.88), low to moderate inter-factor correlations ( $\rho = 0.19$  to 0.61), and discriminated well between Glasgow Outcome Scale (GOS) defined groups. Construct validity of the factors was shown by correlations with relevant neuropsychological domains. Sensitivity to change on the NRS-R was found for the total score and all factor scores except mood/affect and positive symptoms in patients with severe TBI 3 to 6 months postinjury. For patients with GOS score remaining unchanged from 3 to 6 months, significant differences were found for the NRS-R total score and executive/cognition factor. The NRS-R total score and all factor scores correlated significantly with concurrent GOS and Disability Rating Scale (DRS) scores.

**CONCLUSION:** The NRS-R is well suited as a secondary outcome measure for clinical trials in TBI as its completion rate exceeds that of standard brief neuropsychological assessment and it provides important neurobehavioral information complementary to that provided by global outcome measures.