Neurolutions

Summary of Clinical Performance Testing

The Neurolutions System has been evaluated in 40 subjects across three separate clinical studies (described below), all of which evaluated use of the Neurolutions system in chronic stroke survivors. All three studies were designed to determine the feasibility of recording electroencephalogram (EEG) signals from the affected and/or unaffected brain hemispheres, and to use the signals to control a computer to facilitate movement of a robotic hand orthosis (Handpiece). The results of the studies have been analyzed to determine if the Neurolutions System can be used to positively impact rehabilitation. These three studies were open-label studies whereby a literature meta-analysis assessing usual care as well as minimal clinically important difference (MCID) benchmarks were utilized for comparison of device effectiveness in lieu of randomized control data.

Results of testing demonstrate that following 12-weeks of use of the Neurolutions System, chronic stroke survivors showed increases in the mean change from their baseline scores on the primary outcome measure for the three respective studies. Ten of the total 40 subjects were assessed utilizing the Action Research Arm Test (ARAT) as the primary outcome measure and the mean scores exceeded the Minimal Clinically Important Difference (MCID) of 5.7 points (study QRS-0008). In the two other studies (QRS-0012 and QRS-0013), 30 of the total 40 subjects were assessed utilizing the Fugl-Meyer Upper Extremity (UEFM) assessment as the primary outcome measure. For 66.7% of these 30 subjects, mean scores exceeded the MCID of 5.25 points. Overall, ARAT data were collected on a total of 27 subjects from QRS-0008 and QRS-0012 (ARAT was a secondary measure in QRS-0012), while UEFM data were collected in 30 subjects from studies QRS-0012 and QRS-0013. The 17 subjects assessed with ARAT as a secondary measure in QRS-0012, while demonstrating some mean improvement, did not exceed MCID. No patient injury or adverse events occurred in any of the studies.

Results of Pooled Analysis: The results from 30 subjects across two studies (QRS-0012 and QRS-0013) may be validly pooled because the studies have the same primary endpoint and were conducted under nearly identical protocols (including inclusion/exclusion criteria and treatment regimen) and investigated the same version of the device in a very similar patient population (as evidenced by a comparison of the demographic data). Moreover, the primary endpoint, change in UEFM, was compared at the same timepoint, and the studies were weighted relative to their size. Based on the foregoing, a pooled analysis for UEFM, including all 30 subjects from the two studies, resulted in a mean change at 12-weeks of 7.77 points (SD of 5.041, two-sided, one-sample t-test, p-value < .0001), which exceeds the Minimal Clinically Important difference (MCID) of +5.25 points reported in the literature.

Across the two pooled clinical studies (QRS-0012 and QRS-0013), 100% (30/30) of the subjects demonstrated improvement on the primary outcome measure, UEFM. A total of 66.7% of these subjects exceeded the *minimal clinical important difference* (MCID). The MCID is the change in a treatment outcome as measured by a trained clinician and regarded as important and clinically meaningful to health professionals and patients.[1],[2],[3],[4] The remaining 33.3% of the subjects, although demonstrating improvement, did not achieve the MCID.

For a cohort of 12 patients who participated in (QRS-0012), durability data was assessed at 6-months following completion of their 12-week study visit. Durability assessment of the primary and secondary outcome measures revealed these subjects maintained their level of improved functional and motor performance. This demonstrates that the motor improvements achieved with the Neurolutions System therapy were maintained at 6-months following the last device use. However, as durability testing has not

been completed beyond 6-months, persistence of benefits beyond 6-months post device use are currently unknown.

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