

## **Supplementary Material (Appendix):**

### **Experimental Procedures:**

**Transcranial Magnetic Stimulation:** The plane of the coil was parallel to the scalp surface in anterior-posterior direction with the handle at 45° to the mid-sagittal plane.

**Videofluoroscopy (VFS):** Videofluoroscopic images were acquired in real-time using continuous fluoroscopy at 30 frames/s (Videomed system) and recorded by digital video at 25 frames/s (DHR-1000, Sony Ltd, UK) for later off-line analysis.

### **Experimental Protocol:**

Following identifying and marking the cranial vertex on the scalp<sup>21</sup> the brain sites evoking the largest pharyngeal responses in each hemisphere were identified with mapping procedures using single TMS pulses over MI. During the recording of 10 PMEPs at each of MT plus 10% and MT plus 20% intensities for each hemispheric site at baseline, the participants were advised to withhold from any swallowing, coughing, talking, or moving their hands or arms.

### **Data Analysis:**

**Neurophysiological measurements:** Baseline MEP data for all interventions were compared using non-parametric tests. Data were normalised to baseline and shown as percentage change.

Effect sizes were calculated on the mean values and standard deviations (Cohen's *d*, and *r* values are shown in the results section). Spearman's rho correlations were used to test the relationship between changes in cortical excitability and PA scores.

## **Results:**

### **Neurophysiological changes:**

**Response Latencies of the corticobulbar projections:** RmANOVA showed no significant treatment effects on the latencies bilaterally (*Hemisphere*:  $P=.885$ ,  $F_{1,17}=.022$ , *Intervention* (real or sham):  $P=.857$ ,  $F_{1,17}=.03$ ).

### ***VFS outcome measurements:***

***VFS outcome measurements:*** The cumulative PA scores for each subject in each neurostimulation group at baseline and following interventions are shown in Figure 1B. Combining the groups into real and sham conditions, a reduction in percentage change in cPA scores of  $-15.5 \pm 3.5\%$  was observed, while there was an increase in cPA scores in sham arms by  $10.6 \pm 6.8$ . This difference between the two groups was statistically significant ( $z=-2.794$ ,  $P=.005$ , *Wilcoxon's*).

***The effect size of this phenomenon was negative ( $d=-1.1$ ,  $r=-.50$ ), showing that the sham condition demonstrated a larger mean value in cPA scores compared to real stimulation, which translated into a decrease in swallow safety following sham.***