

Examining the Evidence on Neuromuscular Electrical Stimulation for Swallowing: A Meta-analysis

Giselle D. Carnaby-Mann, MPH, PhD; Michael A. Crary, PhD

Objectives: To evaluate the effect of Transcutaneous neuromuscular electrical stimulation (NMES) on swallowing rehabilitation.

Data Sources: MEDLINE, PubMed, CINAHL, NML, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, doc online, Google, and EMBASE were searched for studies using NMES to treat dysphagia between January 1966 and August 2006.

Study Selection: Included were published or unpublished, English-language, clinical trials with a quantifiable dependent variable.

Data Extraction: Two researchers independently performed data extraction. A random-effects model was used to pool study results the Cochran Q test was used to evaluate heterogeneity, and a funnel plot and egger test were used to evaluate publication bias. A best-research synthesis using a methodological quality analysis was conducted.

Data Synthesis: A total of 81 studies were reviewed. Seven were accepted for analysis. A significant summary effect size was identified for the application of NMES for swallowing (Hedges g , 0.66; $P < .001$). Heterogeneity was significant for the combined trials ($P < .10$). When 2 outlier trials were removed, heterogeneity was no longer significant ($P < .08$). Publication bias was not identified on the funnel plot or Egger test ($P = .25$). Best-evidence synthesis showed indicative findings in favor of NMES for swallowing.

Conclusion: This preliminary meta-analysis revealed a small but significant summary effect size for Transcutaneous NMES for swallowing. Because of the small number of studies and low methodological grading for these studies, caution should be taken in interpreting this finding. These results support the need for more rigorous research in this area.