NSW Speech Pathology
Evidence Based Practice Interest Group

Critically Appraised Paper (CAP)

CLINICAL BOTTOM LINE: An intensive swallowing rehabilitation therapy program incorporating the use of sEMG for biofeedback yielded significant improvements in dysphagia based on functional diet level and videofluroscopic severity level measurements in patients with brainstem injury. As there was no control group, there is insufficient evidence to determine if sEMG did or did not change the outcomes for these patients.

Clinical Question [patient/problem, intervention, (comparison), outcome]: Does sEMG change outcomes for patients with dysphagia in stroke and head and neck disease?

Citation: Huckabee, M.L., & Cannito. M.P. (1999). Outcomes of swallowing rehabilitation in chronic brainstem dysphagia: A retrospective evaluation. *Dysphagia* (14). 93-109.

Design/Method:
Retrospective Pre-test / Post-test design.
Nil control group.

Participants:
n = 10. Mean time onset: 26.9 months. Range of onset: 8-84 months. Mean age: 62 years old. Age range: 42-76 years old.
Inclusion criteria: chronic dysphagia due to a single unilateral brainstem injury, greater than 8 months post onset; no substantial recovery of swallow function; exhibit adequate strength and stamina to tolerate intensive program.
Exclusion criteria: have failed intensive therapy due to inadequate cognition/attention; undergoing radiation treatment for oral pharyngeal carcinoma; pre-existing dysphagia or diagnosed neurodegenerative disease; swallowing physiology that is not amenable to rehabilitative management and/or do not exhibit adequate strength or stamina to tolerate the full treatment regimen.

Experimental Group:
Participants received 10 hours of direct rehabilitation across 2 x 1hour sessions per day for 5 consecutive days. Additional 3 x 15 minute independent sessions completed daily at home.
Participants were treated with a combination of therapy (e.g. effortful, Mendelsohn) as appropriate; therapeutic oral feeding with use of airway protection manoeuvres and compensatory strategies and SEMG biofeedback as an adjunct to treatment. Additional auditory feedback (cervical auscultation) provided to some patients.
Outcomes measures included Videoflouroscopy (VFSS) severity levels and Pulmonary symptomology pre–treatment and after 1 week (post-treatment); and functional diet level scale pre-treatment, after 1 week (post-treatment), after 6 months and final outcome.

Control Group: No control.

Results:
Changes were identified across 4 ratings (pre-treatment, after 1 week (post-treatment), after 6 months, final outcome)

1. Pre –treatment: VFSS severity levels 4 (moderate) to 8 (profound), median of 6.5; Median diet level 1 (gastrostomy/jejunostomy only with no oral intake), one patient only on diet level 2 (feeding tube primary and oral secondary).

2. Post–treatment (1 week): VFSS severity levels 2 (mild) to 7 (severe-profound), median of 5.5; Median diet level of 2. Range of diet level 2 to level 3 (Oral primary and feeding tube secondary)

3. 6 months post: Median diet level of 4 (oral intake only with restricted diet texture and PEG removed). Range of diet level 2 to level 5 (full oral intake with minimal texture restriction and PEG removed)

4. Final : Median diet level of 5.

Form based on Worrall & Bennett, Evidence based Practice: Barriers & Facilitators for Speech-Language Pathologists, *Journal of Medical Speech-Language Pathology* 2:9, xi – xvi **Updated February 2006**

Results cont.
Physiological changes in swallowing based on VFSS severity rating from pre-treatment to post-treatment were highly significant.
The change in diet level from pre to post; and post to 6 months were statistically significant.
The reduction in pulmonary symptomology (i.e. presence or absence) pre to post was also significant.

Comments – Strengths/weaknesses of paper

Strengths:

- Frequency of treatment was consistent across participants
- Follow up was conducted to identify if improvements were maintained over time
- Consistent patient group (i.e. similar diagnosis)
- Both impairment based (i.e. 9 point scale) and functional measurements
- Results were statistically analysed and found to be significant

Weaknesses:

- No control
- Inconsistent use of treatment modalities (i.e. rehabilitation manoeuvres, auditory feedback, compensatory strategies, SEMG).
- Frequency and duration of treatment modalities within sessions not specified.
- Effects of SEMG vs. intensity of treatment (as identified by authors)
- Background of clinician conducting treatment not specified
- Limited cohort of patients (number of participants)
- The reliability/validity of the 9 point scale is not specified.

NB: Authors recognised and commented on the effect of possible spontaneous recovery and critical period for recovery.

Level of Evidence (NH&MRC): Level IV – Pre-test, post-test, case series.

Appraised By: Adult Swallowing Group **Clinical Group:** Adult Swallowing Group	**Date:** August 2011

Guidelines for completion of the CAP

Clinical Bottom Line
The consensus of the reviewers on implications of the paper on clinical practice. Whilst this may be somewhat subjective, it is hoped that robust discussion, the Level of Evidence and your comments on the design will enable you to produce a practical/realistic 'bottom line'. Many of the papers in Speech Pathology may have limitations, but the Clinical Bottom line should be aimed to help clinicians apply what evidence there is.

Clinical Question
This should ideally include four components:

- the patient or problem
- the intervention (or diagnostic test or prognostic factor)
- the comparison intervention or test *(optional)*
- the outcome

Design
Refer to pages 12 to 15 of the EBPIG Resource Package for guidance in reviewing the design used.

Comments on Design
Pages 12 to 15 of the Resource Manual should again assist here. You may also find it useful to refer to the forms 'Evaluating case studies/case series' and 'Critical appraisal sheet' adapted from Dr Lil Mikuletic's (see 'Critiquing/Appraising the Evidence).

Level of Evidence
It is recommended that the paper you are reviewing be rated against the NH&MRC Levels of Evidence, as reproduced here. The levels may be updated from time to time by the NH&MRC, but use of the ratings listed here will ensure consistency across CATs and groups. These levels are listed with comments on pages 15 and 16 of the Resource Package.

LEVEL

I. Evidence obtained from a systematic review of all relevant controlled trials

II. Evidence obtained from at least one properly designed randomised controlled trial

III. **1** Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method)
2 Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies, or interrupted time series with a control group
3 Evidence obtained from comparative studies with historical control, two or more single-arm studies or interrupted time series without a parallel control group

IV. Evidence obtained from case series, either post-test or pre-test and post-test