



NSW Speech Pathology Evidence Based Practice Interest Group

Critically Appraised Paper (CAP)

CLINICAL BOTTOM LINE: Pulse Oximetry may detect aspiration in people who have had a stroke when used in conjunction with other assessment tools including videofluoroscopy and bedside assessment. Desaturation of equal to or greater than 2% appeared to detect aspiration +/-penetration with high sensitivity (87%). Aspiration +/- penetration predictive values for pulse oximetry were better when paired with bedside assessment (95%).

Clinical Question: In patients with neurogenic dysphagia is pulse oximetry a reliable assessment tool in identifying episodes of aspiration?

Search Terms: see CAT

Search Systems: see CAT

Citation: Smith, H., Lee, S., O'Neill, P., and Connolly, M. (2000). The combination of bedside swallowing assessment and oxygen saturation monitoring of swallowing in acute stroke: a safe and humane screening tool. *Age and Ageing*, 29. 495-499.

Design: Double blind observational study. On the same day as bedside assessment, videofluoroscopy (VF) with simultaneous pulse oximetry and further bedside assessment were performed. Subjects given varying amounts and consistencies of barium sulphate. Oxygen saturation measured for each swallow and 2 mins after trial.

Participants: 53 acute stroke patients (30 men and 23 women) aged 51-90yrs with acute stroke confirmed by computed tomography scan. 255 consecutive admissions to 2 Manchester hospitals between May 1995 and Feb 1997 with acute haemorrhagic or infarctive stroke. Patients aged 18-90yrs. Of the 255 patients, 202 were excluded according to the exclusion criteria (impaired conscious level, cognitive impairment or receptive dysphasia sufficient to prevent informed consent, inability to sit upright without minimal support, current LRTI, additional neurological condition, terminal illness, other medical condition which in the opinion of the consultant precluded VF).

Experimental Group: as above

Control Group: Nil

Results: 15/53 subjects aspirated as indicated by videofluoroscopy. A fall of greater than 2% identified 13/15 aspirators however there were 23 false positives. False positives occurred with bedside and pulse oximetry assessments. Results initially analysed for aspiration only, then re-examined for aspiration + penetration (thus increasing sensitivity). Changes in oxygen saturation ranged $\uparrow 3\%$ - $\downarrow 14\%$ with a $\downarrow >2\%$ correctly identifying 13/15 aspirators. This gave good sensitivity (80-87%), but low PPV (50-36%).

Comments on Design: Small sample size: 15 aspirated / 56 aspiration swallows. Unclear description of methods and results. Complex statistical descriptions with no raw data provided. Not clear as to how many Speech pathologists/radiologists/physicians conducted and rated the assessments. Small amounts trialed. No documentation of respiratory status.

Level of Evidence (NH&MRC): III stage 2 IV

Appraised By: Adult Communication and Swallowing
Clinical Group: EBP Group

Date: 26/04/2006

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