

Electropalatography Clinical Review

Articles on the Use of EPG in speech and language therapy

1 Review articles on the use of EPG in speech and language therapy

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3 Cleft palate

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4 Down's syndrome

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12 Eating and swallowing

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13 Accent reduction

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14 Typically Developing Children

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Summary

Clinical papers on EPG break down into 14 categories tabulated in Table 1. Since the last review in 2004 there have been an additional 65 publications on the clinical use of EPG taking the total to 228. These publications range from peer reviewed journal articles and Cochrane review to masters and honours student work and cover 12 areas of clinical practice. Efficacy of treatment is evaluated on levels indicated in Table 2. There are no studies with efficacy level higher than III. The majority are level IV, consisting of analysis of clinical speech with anecdotal and expert opinion on the potential benefits of the technique. A small number of papers contain level III evidence consisting of uncontrolled or weakly controlled case studies with one or two clients and exceptionally up to 23 clients.

Paper 1.6 is a review of speech and language therapist case histories involving the use of EPG in therapy and says:

“The results showed that the majority of the group (n = 60) who had received EPG therapy during this period were school-age children with either functional articulation disorders or cleft palate. The sounds most frequently targeted in EPG therapy were /s/, /ʃ/, /t/ and /d/. The (SLTs) judged that the majority of the group had improved their articulation to some extent and almost all had increased awareness of their own articulation difficulties following EPG therapy. Despite these gains, most experienced difficulties generalizing new patterns into everyday speaking situations. The results suggest that when using EPG, SLTs need to adopt specific strategies to promote generalization and maintenance.”

Amongst the papers is paper 3.18, a Cochrane review in the area of Cleft palate, which comes to the same conclusion as this report. “... the current evidence supporting the efficacy of EPG is not strong and there remains a need for high-quality randomised controlled trials to be undertaken in this area.” The establishment of a Cochrane review and/or a pilot study is however a prerequisite for a full randomised controlled trial.”

A student review in the field of Hearing Impairment (7.20) concludes “the evidence base is limited for the use EPG with children and adolescents having severe to profound hearing” impairments.”

Paper 2.24 “Articulatory drift in the speech of children with articulation disorders” studied 10 clients presenting with articulatory disorders who had resisted traditional therapy for a minimum of 1 year. A control group of two children in the same age group were included in the study. The paper shows how EPG reveals that some clients who, on a perceptual level, make no distinction between /d/ and /t/ actually are making an articulatory distinction. This is important in diagnosing whether the child has a motor speech disorder or a phonological disorder. Furthermore, in some cases where sound production is perceived to be acceptable, EPG reveals that the underlying production is abnormal. So that in cases where a client appears to be able to make a particular sound in certain contexts but not in others it becomes clear that the production is abnormal in all contexts and thus the root cause of the disorder can be established and treated.

Papers 1.4 and 2.23 both show that EPG is beneficial in providing visual feedback to change abnormal tongue-palate contact patterns but point out that it is “relatively expensive and not cost effective for clinics with limited caseloads of clients requiring EPG treatment.” Paper 2.23 followed 23 case studies 18 of which successfully completed treatment. Of the 5 who did not, 1 could not tolerate the presence of the palate for long enough to carry out therapy; a second lost a tooth which caused the palate to be loose; the remaining three completed therapy but failed to make progress. On this basis roughly 80% of clients make significant progress when provided with EPG therapy and 5% suffer discomfort, which precludes their participation.

Conclusion

Despite the large number of studies all indicating POTENTIAL effectiveness of the technique there remains a lack of properly controlled studies. The best evidence is provided by single case studies where traditional treatment is observed to provide no improvement in speech after several years of therapy; then, after a few weeks using EPG therapy, significant improvement is observed. Such evidence is weakened in many cases by the use of EPG itself to measure the improvement rather than a “gold standard”. The overall guidance for the use of EPG in speech therapy practice is therefore currently at USPSTF Evidence Grade C defined in Table 3.

“There is fair evidence that the service can improve health outcomes but the balance of benefits and harms is too close to justify a general recommendation.”

This grading should be qualified by noting that there has been no report of bodily harm to patients using EPG in 30 years of use. In fact there are no reports of any negative aspects related to the use of EPG other than a relatively high cost of treatment and the inconvenience of having the palates made before therapy or diagnosis can be carried out. In the grading statement, “harm” refers to the loss of time or money spent on alternative treatments.

Since the last review a survey of therapists has indicated that out of 56 cases 49 showed at least minimal improvement and none showed degradation in speech performance.

There remains an obvious need for controlled clinical trials of EPG to be undertaken if a higher grade of recommendation for use of EPG in speech therapy is to be achieved. However, cost and inconvenience of palate manufacture is identified as the most significant obstacle to more widespread adoption of the technique and needs to be addressed if the grading is to be increased.

Table 1 Clinical papers, number and efficacy level

Category	#	No diagnostic or treatment efficacy	Efficacy Level III	Efficacy Level IV
General Review	19 (+6)		3	16
Developmental disorders	45 (+7)		3	42
Cleft Palate	53 (+17)		2	51
Downs Syndrome	9 (+6)		1	8
Dysfluency	4 (NC)		0	4
Glossectomy	7 (NC)		0	7
Hearing Impairment	21 (+8)		1	20
Laryngectomy	1 (NC)		0	1
Malocclusion & Osteotomy	6 (NC)		0	6
Acquired Neurological disorder	35 (+12)		4	31
Developmental Neuro Disorder	10 (+4)		1	9
Eating & Swallowing	9 (+2)		0	9
Accent Reduction	3 (+1)		0	3
Typically developing Children	6 (+1)		0	6
Total	228 (+65)			

NC = No Change

Table 2 Evidence levels for evaluating quality of treatment studies

Best	Ia Meta-analysis of >1 randomised controlled trial (RCT)
	Ib Well-designed randomised controlled study
	IIa Well-designed controlled study without randomisation
	IIb Well-designed quasi-experimental study
	III Well-designed non-experimental studies, i.e., comparative, correlational, and case studies
Worst	IV Expert committee report, consensus conference, clinical experience of respected authorities

Table 3 Evidence Grading

Grade	U. S. Preventive Services Task Force Evidence Grade
A	Clinicians should routinely provide the service to eligible patients. Good evidence that the service improves important health outcomes and that benefits substantially outweigh harms.
B	Clinicians should routinely provide the service to eligible patients. There is fair evidence that the service improves health outcomes and that benefits outweigh harms.
C	No recommendation that the service should or should not be provided routinely. There is fair evidence that the service can improve health outcomes but the balance of benefits and harms is too close to justify a general recommendation.
D	The service should not be provided routinely to asymptomatic patients. There is fair evidence that the service is ineffective or that harms outweigh benefits.

Name: A. Wrench

Signature: 

Position: R & D Manager

Date: 30/05/11