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## Chapter 5: The therapy approach

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### Oro-motor exercises

#### Content

Advice sheets for parents (Voice sheet – **new**)

Oro-motor equipment list (Appendix 2)

Voice worksheets (**new**)

Lip shapes and games (Appendix 6)

#### Aims

- 1 To increase the range, accuracy, strength and speed of oral movements
- 2 To develop voluntary control of oral movement
- 3 To develop awareness of oral structures
- 4 To develop motor programs underlying specific features of speech sounds
- 5 To provide a non-threatening way in to therapy for children who are wary of direct speech work

#### Introduction

Speech production involves a number of integrated activities: cognitive, linguistic, perceptual and motoric (Stoel-Gammon and Dunn 1985; Levelt 1989; Crary 1993). The interaction between the developing motor system and the process of speech acquisition has been explored widely in the literature (Menn 1983; Kent 1984; Hewlett 1990; MacNeilage and Davis 1990). In normally-developing children, neuromotor control in speech production is thought to develop gradually in childhood, probably not being mature until about 12 years of age (Tingley and Allen 1975; Kent 1976; Netsell 1981). Evidence to support this view comes from studies demonstrating: increased rates and consistency of production with age, as well as increased adaptability and compensation for external factors (Hawkins 1984; Smith and Goffman 1995; Waters 1996).

Praxis is involved in speech motor control, and is thought to develop gradually, in parallel with other speech motor skills. It has been defined by Kools and Tweedie (1975) as “the ability to perform skilled movements on command or demonstration” and Crary (1993) as “control over voluntary movement”. As far as speech praxis is concerned, Milloy (1991) described it as the point “when motor skills reach the stage of automatic movement to enable them to produce reliable articulation on each attempt at production”.

Speech motor control in children with speech difficulties has also been investigated. Studies have suggested that some children with speech difficulties, have poorer speech motor control than matched normally-developing children of the same age (Edwards

1991; Towne 1994; Waters 1996). Bramm, Anderson and Waters (1992) and Waters (1996) acknowledged that a therapy approach which provides opportunities for developing speech motor (articulatory) skills, in addition to phonological skills, may be required in such cases.

By definition, difficulties with the development of "praxis" are thought to be central to the condition developmental verbal dyspraxia. Some studies have investigated the nature of "praxic difficulties" in children with speech difficulties (Aram and Horwitz 1983; Dewey, Roy et al 1988). Particular difficulties were identified with tasks involving sequenced (rather than isolated) oral movements and speech productions. General praxic difficulties, affecting fine motor control have also been identified in some children (Bradford and Dodd 1996).

Although the role of speech motor control in speech acquisition is well accepted, the role of oral motor control is much less clear. Consequently, the relevance of including oro-motor exercises (particularly involving movements external to the mouth) in a therapy programme for a child with speech difficulties remains debatable. Edwards (1984), Lancaster and Pope (1989) and Dodd (1995) have all questioned the relevance of such activities:

**Edwards (1984)** "Articulation training in older children should concentrate on speech itself rather than on non-speech movements, bearing in mind that to improve speech, nothing works as well as practice of speech".

**Lancaster and Pope (1989)** "...motor programming of non-speech movement may be independent of motor speech programming, so that treatment which focuses on one level may have little effect on the other".

**Dodd (1995)** "There is as yet no evidence that therapy focusing on oral movements benefits speech production. Therapy focusing on oral movements has the limited aim of remediating delayed oro-motor development or an oral dyspraxia".

However, other authors have claimed that there is neurological evidence to support a close link between non-speech oral movement and speech production. For example Crary (1993) cites evidence from neurological studies in both adults and children to support this view: Mateer's (1983) studies of adults with left-hemisphere lesions indicated a close link between cortical systems controlling oral movements and speech production. Similarly PET scan studies have showed that similar cortical areas are activated during both speech production and production of silent oral movements. In children, findings have been less clear-cut. However, there is some evidence of a temporal link between nonspeech and speech neural systems from the beginning (Simonds and Schiebel 1989). Crary (1993) concluded that:

"a variety of investigational techniques in both adults and children have implicated a neurological relationship between nonspeech oral movement and speech production".

In line with other "bottom-up" therapy approaches, oro-motor exercises are seen as an integral part of the Nuffield Dyspraxia Programme.

It is recognized that not all children with verbal (or articulatory) dyspraxia have an oral dyspraxia (see Chapter 1: Literature review) and therefore oro-motor exercises may not need to be included in every child's remediation programme. However, for other children, who demonstrate difficulties in producing non-speech oral movements, volitionally, and who have speech difficulties, a therapy programme incorporating oro-motor exercises is indicated.

As **Connery (1994)** explains: the role of oro-motor work can extend beyond improving volitional control over oral movements. She stresses the complementary nature of oro-motor work and speech work. For example, oro-motor exercises to develop a range of lip movements are linked with production of sounds which require different lip shapes e.g. for long vowels: a rounded shape for "oo"; a spread lip shape for "ee"; a wide open shape for "ah".

For simplicity, oro-motor activities are introduced independently of speech sounds, but the increased control gained through exercise, is then utilized in speech sound production work. Movements with more tangible targets e.g. tongue protrusion and lateral movements external to the mouth are usually introduced, before movements with less clearly defined targets e.g. tongue elevation to the alveolar ridge etc.

Other benefits of oro-motor work are described by Connery (1994):

- Children usually regard such activities as fun.
- Children with speech difficulties tend to perceive oro-motor tasks as non-speech activities, and therefore are willing to cooperate for such tasks. They can provide a useful introduction to speech activities for a child who is very resistant to speech work.
- Speech and language therapy sessions focusing on speech work can be broken up by oro-motor work, reducing fatigue and enabling the child to work for longer.

Further benefits might include:

- A "warm-up" for the speech musculature - principles of motor skill learning indicate that a few minutes working on oro-motor exercises at the beginning of a therapy session can also be viewed as a "warm up" for the speech musculature prior to working on speech production (similar to stretching exercises prior to commencing sporting activity).
- Early informal intervention - oro-motor exercises can be introduced to young children (and their parents), along with other auditory and speech strategies, before formal therapy sessions commence (see Advice sheets for parents in first Ringbinder).
- Creation of kinaesthetic representations - oro-motor exercises can help the child develop a mental map of his mouth, linked to a vocabulary of movements and positions e.g. up, back, together, open, etc. These representations can later act as triggers or cues when working on single sound elicitation.
- Working from strengths - children who do not have overt oro-motor difficulties may still benefit from oro-motor work, as a preliminary step in therapy. A therapy approach starting from the child's point of strength, which establishes conscious control over existing automatic movements and introduces a vocabulary of elicitation cues, can be a very helpful introduction to speech sound work.

Traditionally, oro-motor work has been directed to exercises for the lips, tongue and soft palate. **Edwards (1984)** drew attention to the relevance of laryngeal control for some children "Why not respiro-laryngeal dyspraxia?" Clinical work over the past 20 years at the Nuffield Hearing and Speech Centre supports her view - many children with dyspraxic type difficulties in their speech, present with atypical voices: - husky, gravelly, creaky and/or breathy type presentations can occur. On ENT examination, there is rarely any pathological finding, suggesting that the difficulty lies in the controlled timing of the vocal folds and the expiratory airstream, leading to phonatory and vocal difficulties. In