
Chapter 5: The therapy approach

Expanding the phonetic inventory

Contents

- Early sound making activities (new)
- Lip shapes and articulograms
- Voice worksheets
- Eliciting sounds (Appendix 4)

Aims

- 1 To establish motor programs for a range of consonants and vowels
And, as appropriate,
- 2 To develop motor programs underlying specific features of speech sounds
- 3 To develop awareness and control of lips, tongue, airstream and voice for speech
- 4 To increase the accuracy of articulation

Eliciting sounds

The first challenge when working with children with DVD is to elicit a range of sounds and syllables. At the beginning of therapy, children are frequently unable to imitate several of the earlier developing consonants and vowels.

Various strategies can be used to attempt to elicit sounds. Bernthal, Bankson and Flipsen (2009, p 287) identify four approaches:

- imitation, from an auditory/visual model
- phonetic placement, where the SLT instructs the child where to place the articulators to produce a specific sound
- successive approximation, where a new sound is shaped from one already in the child's repertoire
- contextual utilisation, where a sound is isolated from a particular phonetic context in which the child happens to produce it correctly.

Imitation is the simplest and therefore preferred method. Frequent clear models should always be given when working on sound production.

Examples of each of the other approaches can be found in Appendix 4 – Eliciting sounds, where strategies for eliciting specific sounds are described.

Young children with DVD are often not only unable to imitate sounds but also have difficulty organising oral movements to follow instructions regarding phonetic placement. They may have a very limited phonetic repertoire, and find it difficult to modify existing motor programs. Hence, both successive approximation and contextual utilization may be of limited use.

Further strategies used to elicit sounds in children with DVD include assisted movement, which ranges from helping the child to achieve lip and jaw positions (examples can be found in Appendix 4 and also in the Early Sound Making worksheets in Therapy Resources p6), to the complex system of tactile cues used in PROMPT (Hayden, Eigen, Walker and

Olsen, 2010). For older children with persisting articulation difficulties with lingual consonants, use of an electropalatograph (EPG) may be considered.

The role of oral motor exercises

The NDP has traditionally used nonspeech oral motor exercises (NSOMES), i.e. in the main, licking and blowing activities, to develop awareness and control of oral movements, as a precursor to phonetic placement techniques. Indeed oral motor skills have been viewed as the foundation for speech motor control, and therefore a necessary component of intervention for at least some children with DVD (Williams and Stephens 2004).

NSOMES are defined as any non-speech intervention that aims to “influence tongue, lip and jaw resting postures, increase strength, improve muscle tone, facilitate range of motion and develop muscle control” (Ruscello 2008). Clark (2010) summarises as follows:

“...the underlying assumption (of NSOMES) is that facilitating sensorimotor function of the speech musculature during nonspeech activities will enhance sensorimotor control for speech sound production”.

However, recent reviews of the theory and evidence base for NSOMES (Lof 2003; Lass and Pannbacker 2008; McCauley, Strand, Lof and Schooling 2009) have challenged both the logic and the effectiveness of targeting oro-motor skills with a view to improving speech. A position paper on childhood apraxia of speech produced by the American Speech-Language Hearing Association (2007) concludes that the consensus opinion among researchers is that nonspeech oro-motor therapy is not necessary or sufficient for improved speech production. Two recent surveys of the literature conclude that there is currently insufficient evidence to support or refute the use of NSOMES to produce effects on speech (McCauley, Strand, Lof and Schooling 2009; Ruscello, 2010).

In the light of these conclusions, the recent RCSLT UK Policy Statement on Developmental Verbal Dyspraxia (2011) advised caution in the use of such approaches.

Having examined the arguments and the evidence afresh (see below), we have modified our recommended approach.

Theoretical issues

Ruscello (2008) points out that “when a practitioner employs a specific treatment, there is an implicit acceptance of the theory underlying the treatment”. The rationale for the use of NSOMES in speech sound disorders is based on the following assumptions:

- developmental speech disorders are caused by neuromuscular impairment
- neuromuscular control for speech and nonspeech actions is the same
- learning can be facilitated by working on components of a skill separately.

These assumptions are disputed in the light of recent research and current theoretical understanding.

The nature of DVD

While children with a diagnosis of DVD may have difficulty with the control of oral movements, muscle weakness and disorders of muscle tone are not consistent with this diagnosis. Children with DVD should not therefore need exercises to strengthen muscles or normalize muscle tone. Where children have a mixed dyspraxic/dyspraxic presentation, a case might be made for targeting these areas.

It should also be noted that it has been shown that relatively little force is required for speech. Clark (2010) indicates that forces produced during normal speech are around 20% of the maximum force that can be produced by the articulators in nonspeech movements.

Specificity of neuromotor control

If the control of articulatory structures is the same for speech and non-speech activities, it is logical to assume that skills/control will carry over from one to the other.

Unfortunately, the evidence does not support this view. Speech has been found to require finer levels of coordination and lower levels of strength in comparison with nonspeech movements (ASHA 2007). Lof (in Bowen 2009) cites studies of various articulatory structures including lips, jaw, tongue and palate, which demonstrate that organisation of speech and nonspeech oral movement within the nervous system is different. For example, a Study by Bonilha, Moser, Rorden et al (2006) demonstrated by means of functional magnetic resonance imaging (fMRI) that different parts of the brain are activated during speech and nonspeech movements.

This makes it unlikely that practising nonspeech movements, such as licking and blowing will result in improved speech. Further, it challenges the usefulness of practising skills such as lateral tongue movements which are not components of speech.

Motor learning theory

Research into the learning of motor skills has suggested that complex and highly integrated skills are more efficiently learned as whole units, rather than broken down into component skills which are practised separately.

This has been used to argue that it may be counterproductive in speech interventions to break skills into smaller components, and specifically to target oro-motor skills (Forrest 2002). However, it should be remembered that the research cited did not investigate speech skills or speech interventions. Moreover, the participants being trained presumably had intact neuromotor control. Whereas normal speech development does involve learning whole words, the child with DVD may be unable to learn in this way. Indeed it is suggested that a core component of DVD is a difficulty in learning speech motor skills.

Effectiveness of NSOMEs as intervention for speech disorders

Two systematic reviews of the evidence for the effectiveness of NSOMEs have been carried out recently by McCauley, Strand, Lof and Schooling (2009) for ASHA, and Ruscello (2010). Both conclude that there is currently insufficient evidence to support or refute the use of NSOMEs to produce effects on speech. It should be noted that mixed interventions, where NSOMEs were combined with speech interventions, were not investigated in these reviews.

Conclusions on the use of NSOMEs

- Practising non-speech activities such as licking and blowing, in isolation, is unlikely to change speech.
- Targeting strength or muscle tone in children with a diagnosis of DVD is not necessary.
- Any non-speech movements targeted should be closely linked to the target sound, i.e. a component movement, such as lip closure, should be followed by production of / m / where possible. (See Early Sound Making sheets, Therapy Resources 1, p6)