



## *Detailed Outline and Suggested Reading*

### **Introduction to Acquired Motor Speech Disorders**

- Dysarthria and Apraxia as a neurological motor speech impairment
- Overview of causes and features, incidence and prevalence
- Speech motor control
- Processes and parameters
- Relationship between speech and swallowing
- Variable factors in dysarthria
- Course of dysarthria
- Impact of dysarthria
- Dysarthria within the ICF framework
- Overview of the role of the speech and language therapist in dysarthria management.

Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management*, 2<sup>nd</sup> edition. St Louis: Mosby. (Pages 3-5, chapter 3).

McNeil, M. R., (Ed.), 2008. *Clinical management of sensorimotor speech disorders*. New York: Thieme.

Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Pages 1 – 3).

Murdoch, B.E., et al, 2000, Dysarthria: Clinical features, neuroanatomical framework and assessment. In I. Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (See pages 103 – 104, for revision of neuroanatomical aspects of speech control see also 104 – 105, 113 – 115, 119 – 121, 126 – 127, 132 – 133).

Yorkston, K. M., Beukelman, D. R., Strand, E., & Hakel, M., 2009, (in press). *Management of motor speech disorders in children and adults, 3rd edition*. Austin, TX: Pro-Ed. (Chapter 1: Perspectives on Motor Speech Disorders).

### **Types of motor speech disorders**

#### **For each type:**

- The principal general effects of damage at that level
- Main causes of the type of dysarthria/apraxia
- Speech features
- Aspects of medical management
- Particular aspects of SLT management





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### **Flaccid**

- Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management*, 2<sup>nd</sup> edition. St Louis: Mosby. (Chapter 4. Pages 39-45 may also be relevant re: neuroanatomy).
- Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (Chapter 4).
- Hageman, C., 1997, Flaccid Dysarthria. In M.C. Cannito et al (Eds.), *Neuromotor Speech Disorders*. Baltimore: Brookes. (Pages 193-216).
- Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Chapter 6).
- Murdoch, B. E., et al, 2000, Dysarthria: Clinical features, neuroanatomical framework and assessment. In I. Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (See pages 104 - 112).

### **Spastic (Upper Motor Neurone) Dysarthria**

- Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management*, 2<sup>nd</sup> Edition. St Louis: Mosby. (Chapter 5 and chapter 9 for unilateral UMN. (Pages 45-49 may also be relevant re: neuroanatomy).
- Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (Chapter 5).
- Murdoch, B.E., Thompson, E.C., and Theodoros, D.G., 1997, Spastic Dysarthria. In M.C. Cannito et al (Eds.), *Neuromotor Speech Disorders*. Baltimore: Brookes. (Pages 287-310).
- Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Chapter 7).
- Murdoch, B. E., et al, 2000, Dysarthria: Clinical features, neuroanatomical framework and assessment. In I Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (See pages 113-119).

### **Ataxic (Cerebellar) Dysarthria**

- Cannito, M.P., and Marquardt, T.P., 1997, Ataxic dysarthria. In M.R. McNeil (Ed.), *Clinical Management of Sensorimotor Speech Disorders*. New York: Thieme. (Pages 217-248)
- Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management*, 2<sup>nd</sup> Edition. St Louis: Mosby. (Chapter 6).
- Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (Chapter 7).
- Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Chapter 8).
- Murdoch, B.E., et al, 2000, Dysarthria: Clinical features, neuroanatomical framework and assessment. In I. Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (See pages 119-126).





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### **Mixed dysarthria: Multiple Sclerosis**

- Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management*, 2<sup>nd</sup> Edition. St Louis: Mosby. (Pages 277, 289-290).
- Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (Pages 258- 264).
- Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Pages 345 – 350).
- Murdoch, B.E., et al, 2000, Dysarthria: Clinical features, neuroanatomical framework and assessment. In I. Papathanasiou (Ed.), *Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (Pages 136-137).
- Murdoch, B., and Theodoros, D., 2000, *Speech and Language Disorders in Multiple Sclerosis*. London: Whurr.
- Yorkston, K. M., Miller, R. M., & Strand, E. A., 2004, *Management of Speech and Swallowing Disorders in Degenerative Disease*, 2nd edition. Austin, TX: Pro-Ed. (Pages 180-189).

### **Mixed dysarthria: Motor Neuron Disease**

- Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management*, 2<sup>nd</sup> edition. St Louis: Mosby. (Pages 267-277, 285-289).
- Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (Pages 258-261, 266-267, 271-274).
- Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Pages 337-345).
- Murdoch, B. E., et al, 2000, Dysarthria: Clinical features, neuroanatomical framework and assessment. In I. Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (Pages 134, 136).
- Yorkston, K. M., and Beukelman, D. R., 2000, Dysarthria: an overview of treatment. In I. Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (Pages 165-166).
- Yorkston, K. M., Miller, R. M., & Strand, E. A., 2004, *Management of Speech and Swallowing Disorders in Degenerative Disease*, 2nd edition. Austin, TX: Pro-Ed. (Pages 19-50).

### ***Clinical resource***

The MND resource file: a patient and carer centred approach for health and social care professionals. Motor Neuron Disease Association, UK, (2000).



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### **Hypokinetic Dysarthria in Parkinson's Disease**

- Adams, S.G., 1997, Hypokinetic Dysarthria in Parkinson's Disease. In M.C. Cannito et al (Eds.), *Neuromotor Speech Disorders*. Baltimore: Brookes. (Pages 261-286).
- Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management*. St Louis: Mosby. (Chapter 7).
- Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (Chapter 8).
- Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Chapter 9).
- Murdoch, B. E., et al, 2000, Dysarthria: Clinical features, neuroanatomical framework and assessment. In I. Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (See pages 126-132).
- Yorkston, K. M., Miller, R. M., & Strand, E. A., 2004, *Management of Speech and Swallowing Disorders in Degenerative Disease, 2nd edition*. Austin, TX: Pro-Ed. (Pages 99-121).

### ***Clinical resource***

Swinburn, K., and Morley, R., 1996, *Parkinson's Disease Management Pack*. London: Whurr.

### **Apraxia of Speech:**

- Processing models and theoretical differentiation from dysarthria and phonemic paraphasia
- Relationship with aphasia
- Primary and other characteristics
- Is speech apraxia a discrete condition?
- Non-speech apraxias
- Data and differential diagnosis

- Duffy, J. R., 2005, *Motor Speech Disorders, 2<sup>nd</sup> edition*. St Louis: Mosby. (Chapter 11. See also pages 421-423 re: differentiation from dysarthria and aphasia).
- Marquardt, T. P., and Cannito, M. P., 1996, Treatment of verbal apraxia in Broca's aphasia. In G. L. Wallace (Ed.), *Adult Aphasia Rehabilitation*. Boston: Butterworth-Heinemann. (Pages 205 – 211).
- McNeil, M. R., 2002, (Ed.) Apraxia of speech: from concept to clinic: *Seminars in Speech and Language*, 23, 4, 221-323.
- McNeil, M.R., Robin, D.A., and Schmidt, R.A., 2008, Apraxia of speech. In M.R. McNeil (Ed.), *Clinical Management of Sensorimotor Speech Disorders*. New York: Thieme. (Pages 249-268).



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## A Pre-Qualifying Curriculum for Motor Speech Disorders

### Assessment

- Purpose of assessment
- Types of data, and their analysis and evaluation:
- Background information
- Patient and caregiver ratings/impressions
- Intelligibility testing
- Physical assessment
- Psychosocial Impact

Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management*, 2<sup>nd</sup> edition, St Louis: Mosby. (Pages 9-11 and chapter 3).

Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (Chapter 2).

Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Chapter 2. Chapters 3 and 4 deal with instrumental and acoustic assessment).

Wood, S. J., and Hardcastle B., 2000, Instrumentation in the assessment and therapy of motor speech disorders: a survey of techniques and case studies with EPG. In I. Papathanasiou, (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (See pages 203 – 207, and subsequent pages for detail of specific procedures).

Yorkston, K. M., Beukelman, D. R., Strand, E., & Hakel, M., 2009 (in press), *Management of motor speech disorders in children and adults*, 3rd edition. Austin, TX: Pro-Ed. (Chapter 2. Clinical Examination of Motor Speech Disorders).

### Management and intervention

- Direct therapy for involved parameters (symptom treatments)
- Compensatory/maximisation strategies
- Patient and carer support, information and advice, including how to maximise communication effectiveness
- Alternative/Augmentative communication
- patient-centred model
- carer-centred model
- context-centred model
- motor learning theory
- impact of dysarthria / apraxia

Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management*, 2<sup>nd</sup> edition. St Louis: Mosby. (Chapter 16 and pages 493-498).

Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Chapter 5).

Yorkston, K. M., Miller, R. M., & Strand, E. A., 2004, *Management of Speech and Swallowing Disorders in Degenerative Disease*, 2nd edition. Austin, TX: Pro-Ed.





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Yorkston, K. M., Beukelman, D. R., Strand, E., & Hakel, M., 2009, (in press), *Management of motor speech disorders in children and adults, 3rd edition*. Austin, TX: Pro-Ed. (Chapter 4. Treatment Planning in Motor Speech Disorders).

### Intervention for specific components

#### Articulation

- Speech versus non-speech practice
- Decision re which sound(s) to target first
- Nonsense syllables versus real words
- Building up length and complexity
- Intelligibility as the priority

Duffy, J. R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management, 2<sup>nd</sup> Edition*. St Louis: Mosby. (Pages 477-479).

Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (See in relation to specific dysarthria types).

Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Pages 155-159).

Robertson, S. J., and Thomson, F., 1986, *Working with Dysarthria*. Bicester: Winslow Press. (Pages 32-620).

Swigert, N. B., 1997, *The Source for Dysarthria*. East Moline: LinguSystems. (Pages 197-208 and related practice material).

Yorkston, K. M., Beukelman, D. R., Strand, E., & Hakel, M., 2009, (in press), *Management of motor speech disorders in children and adults, 3rd edition*. Austin, TX: Pro-Ed. (Chapter 9).

#### Breathing and Phonation

- Indications of deficits in these parameters
- Increasing respiratory support versus optimum management of available breath supply and phrasing,
- Posture
- Loudness
- Phonation, voice quality and pitch: including medical and prosthetic approaches
- LSVT

Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management, 2<sup>nd</sup> edition*. St Louis: Mosby. (Pages 466-472) (389-394, 1995 edition).

Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (See in relation to specific dysarthria types).

Hixon, T., & Hoit, J. D., 2005, *Evaluation and Management of Speech Breathing Disorders: Principles and Methods*. Tucson, AZ: Redington Brown.





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- Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Pages 135-147).
- Robertson, S. J., and Thomson, F., 1986, *Working with Dysarthria*. Bicester: Winslow Press. (Pages 18-32, 81).
- Yorkston, K. M., Beukelman, D. R., Strand, E., & Hakel, M., 2009, (in press), *Management of motor speech disorders in children and adults, 3rd edition*. Austin, TX: Pro-Ed. (Chapter 5 & 6).

### **Speech rate**

- Variables affecting rate
- Methods of altering rate
- Relationship between rate and intelligibility

### **Prosody: Stress and intonation**

- Variables affecting stress
- Relevant dysarthria parameters
- Therapy approaches

- Duffy, J. R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management, 2<sup>nd</sup> edition*. St Louis: Mosby. (Pages 479-484) (400-404, 1995 edition).
- Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (See in relation to specific dysarthria types).
- Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes. (Pages 159-165).
- Robertson, S. J., and Thomson, F., 1986, *Working with Dysarthria*. Bicester: Winslow Press. (Pages 63-65, 80-85).
- Swigert, N. B., 1997, *The Source for Dysarthria*. Moline: LinguSystems. (Pages 197-208 and related appendices).
- Yorkston, K. M., Beukelman, D. R., Strand, E., & Hakel, M., 2009, (in press), *Management of motor speech disorders in children and adults, 3rd edition*. Austin, TX: Pro-Ed. (Chapter 8 & 9).

### **Velar dysfunction**

- Perceptions of nasality: hypo and hyper
- Measurements of nasality
- Palatal mobility and speed
- Palatal lift appliances and other approaches

- Duffy, J.R., 2005, *Motor Speech Disorders: Substrates, Differential Diagnosis and Management, 2<sup>nd</sup> edition*. St Louis: Mosby. (Pages 472-476, or pages 394-397 in 1995 edition).
- Freed, D., 2000, *Motor Speech Disorders: Diagnosis and Treatment*. San Diego: Singular. (See in relation to specific dysarthria types)
- Robertson, S. J., and Thomson, F., 1986, *Working with Dysarthria*. Bicester: Winslow Press. (Pages 33-34).





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- Kaye, M. S., 2000, *Guide to Dysarthria Management: A Client-Clinician Approach*. Eau Claire, WI: Thinking Publications.
- Murdoch, B.E., 1998, *Dysarthria: A Physiological Approach to Assessment and Treatment* Cheltenham: Stanley Thornes. (Pages 147-155).
- Swigert, N. B., 1997, *The Source for Dysarthria*. Moline: LinguSystems. (Pages 125-128 and related appendices).
- Yorkston, K. M., Beukelman, D. R., Strand, E., & Hakel, M., 2009, (in press), *Management of motor speech disorders in children and adults, 3rd edition*. Austin, TX: Pro-Ed. (Chapter 7).

### Apraxia of Speech:

- PROMPT
- Melodic Intonation Therapy
- Metric Approach
- Direct articulation treatment
  - Initial muteness
  - Facilitating and cueing
  - Extending the inventory of speech sounds
  - Principles of motor learning
  - Multisyllabic words
- Practice of useful words and phrases
- Augmenting speech attempts/total communication

- Brookshire, R.H., 2007, *Introduction to Neurogenic Communication Disorders, 7<sup>th</sup> edition*. St Louis: Mosby. (Pages 606-617).
- Hux, K., et al, 2008, Communication based interventions: augmented and alternative communication for persons with aphasia. In R Chapey (Ed.), *Language Intervention Strategies in Adult Aphasia and Related Neurogenic Communication Disorders, 5<sup>th</sup> edition*. Philadelphia: Lippincott, Williams and Wilkins. (Especially p.821-834).
- Miller, N., 2000, Changing ideas in apraxia of speech. In I. Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (Pages 194-198).
- Pound, C., et al 2000, *Beyond Aphasia: Therapies for Living with Communication Disabilities*. Bicester: Winslow.
- Wambaugh, J.L., et al, 2006, Treatment guidelines for acquired apraxia of speech: treatment descriptions and recommendations. *Journal of Medical Speech-Language Pathology*, 14, xxxv-lxvii (This review summarises all treatment approaches and their outcome literature).





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- Wambaugh, J.L., and Shuster, L., 2008, The nature and management of neuromotor speech disorders accompanying aphasia. In R. Chapey (Ed.), *Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders, 5th edition*. Philadelphia: Lippincott, Williams and Wilkins. (Pages 1017 – 1030 + appendices).
- Yorkston, K. M., Beukelman, D. R., Strand, E., & Hakel, M., 2009, (in press), *Management of motor speech disorders in children and adults, 3rd edition*. Austin, TX: Pro-Ed. (Chapter 12).

### **AAC:**

- AAC for people with dysarthria.
- Specific characteristics, problems and strengths with respect to AAC intervention.
- Text based AAC systems:
  1. Low tech aids: different types and sizes of alphabet boards with or without phrases, words and communication strategies.
  2. High tech aids: Speech-generating devices and software based on spelling and synthesized speech. Rate enhancement techniques: prediction, encoding.
- Alternative access: eye-pointing, head mouse, track-ball, computerized and manual scanning, eye-pointing, headlight-pointing.

- Beukelman, D.R., & Mirenda, P., 2005, *Augmentative and Alternative Communication: supporting children & adults with complex communication needs*. Baltimore: PH Brookes Publications.
- Beukelman D.R, Garrett K., Yorkston K.M ., 2007, *Communication strategies for adults with acute or chronic medical conditions*. Baltimore, MD: PH Brookes Publications.
- Beukelman, D. R., Garrett, K. L., & Yorkston, K. M., (Eds.), 2007, *Augmentative communication strategies for adults with acute and chronic medical conditions*. Baltimore, MD: PH Brookes Publications.
- Fried-Oken, M., Hand, A., Bersani, H., 2000, *Speaking up and spelling it out*. Baltimore: Paul Brookes. (Prolog, chapter 12 and chapter 23).

### **Treatment outcome/effectiveness**

- Considerations re assessing the benefits of intervention
- What to measure
- Examples of PD studies, using different approaches

- Mackenzie, C., and Lowit, A ., 2007, Behavioural intervention effects in dysarthria following stroke: communication effectiveness, intelligibility and dysarthria impact. *International Journal of Language & Communication Disorders*, 42, 131 -153.
- Palmer, R., and Enderby, P., 2007, Methods of speech therapy treatment for stable dysarthria: A review. *Advances in Speech-Language Pathology*, 9, 140-153.
- Royal College of Speech and Language Therapists, 2005, *RCSLT Clinical Guidelines*. London: RCSLT. (Pages 93-96, 264-273) available online.





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Yorkston, K. M., and Beukelman, D. R., 2000, Dysarthria: an overview of treatment. In I. Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (Pages 166-168).

The following reviews are available from the Academy of Neurologic Communication Disorders and Sciences (ANCDS) (<http://www.ancds.org/>):

Hanson, E. K., Yorkston, K. M., & Beukelman, D. R., 2004, Speech supplementation techniques for dysarthria: A systematic review. *Journal of Medical Speech-Language Pathology*, 12(2), ix-xxix.

Spencer, K. A., Yorkston, K. M., & Duffy, J. R., 2003, Behavioral management of respiratory/phonatory dysfunction from dysarthria: A flowchart for guidance in clinical decision-making. *Journal of Medical Speech-Language Pathology*, 11(2), xxxix-ixi.

Yorkston, K. M., Spencer, K. A., Duffy, J. R., Beukelman, D. R., Golper, L. A., Miller, R. M., Strand, E. A., & Sullivan, M., 2001, Evidence-Based Practice Guidelines for Dysarthria: Management of Velopharyngeal Function. *Journal of Medical Speech-Language Pathology*, 9(4), 257-273.

Yorkston, K. M., Spencer, K. A., & Duffy, J. R., 2003, Behavioral management of respiratory/phonatory dysfunction from dysarthria: A systematic review of the evidence. *Journal of Medical Speech-Language Pathology*. 11(2), xiii-xxxviii.

Yorkston, K. M., Hakel, M., Beukelman, D. R., & Fager, S., 2007, Evidence for effectiveness of treatment of loudness, rate or prosody in dysarthria: A systematic review. *Journal of Medical Speech-Language Pathology*, 15(2), xi-xxxvi.

### Prognosis in Dysarthria

- Prognosis regarding what?
- Stable versus progressive conditions
- Relevant contributing factors

McNeil, W.R., Rosenbek, J.C. & Aronson, A.E., 1984, *The Dysarthrias: Physiology, Acoustics, Perception, Management*. San Diego: College Hill (23-26).

Theodoros, D.G., and Thompson-Ward, E.C., 1998, Treatment of dysarthria. In B.E. Murdoch (Ed.), *Dysarthria: A Physiologic Approach to Assessment and Treatment*. Cheltenham: Stanley Thornes.(Pages 130-132).

Yorkston, K.M., and Beukelman, D.R., 2000, Dysarthria: An overview of treatment. In I. Papathanasiou (Ed.), *Acquired Neurogenic Communication Disorders: A Clinical Perspective*. London: Whurr. (Pages 166 – 168).

Yorkston, K. M., Beukelman, D. R., Strand, E., & Hakel, M., 2009, (in press), *Management of motor speech disorders in children and adults, 3rd edition*. Austin, TX: Pro-Ed.

