

KSHA 2011, Overland Park, KS

Interpreting Voice and Swallowing Intervention Research for the Practicing SLP

Jeff Searl, Ph.D., CCC-SLP
University of Kansas
Medical Center

jsearl@kumc.edu



1

Overview: Voice Tx Research

I. Our information base

- a) Where do we get our info?
- b) Are we any good at accessing it?
- c) Issues and barriers to accessing the info?

II. Evidenced Base Practice – reminders

- a) definitions, what ASHA says, etc.
- b) Brief comment on study designs

III. Voice Tx Approaches: a few examples

- a) Behavioral Intervention for hyperfunction – in general
- b) Muscle Tension Dysphonia
- c) Paradoxical Vocal Fold Movment

KSHA 2011 Overland Park, KS



2

Our Information Base: What's available

I. Peer-reviewed journal articles

- a) Individual studies – if this is all we have, can be time consuming, but necessary
- b) Systematic reviews
- c) Meta-analyses

II. Non-peer reviewed materials – books, internet resources, products from other clinics/clinicians

KSHA 2011 Overland Park, KS



3

Our Information Base: What's available

• Individual Studies - How I read/review them

- Quick scan of Abstract
- Detailed exam of tables/figures – why 1st?
- Read through the full manuscript without stopping too much making note of...
- Read again for the details
 - What formed the basis for their study – did it even make sense to ask the question they asked, devise the therapy they devised, etc.
 - Make sure you know what their hypothesis was
 - Spell out what assumptions they are making (explicit or implicit)
 - Judge appropriateness of methods, data interp
 - Does the data support the hypotheses? Why/why not?
- Do I have other individual studies in this same area of treatment to look at?

KSHA 2011 Overland Park, KS



4

Our Information Base: What's available

- Systematic Reviews and Meta-analyses – not all systematic review are meta-analysis, and vice versa



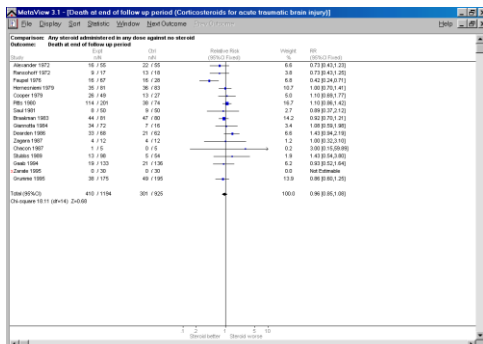
- Where do we find them?
 - Cochrane Collaboration (<http://www.cochrane.org/>)
 - Scientific journals
 - Expert Working Groups – proceedings papers, etc.
 - Agency for Healthcare Research and Quality (AHRQ; <http://www.ahrq.gov/>)
 - Scottish Intercollegiate Guideline Network (<http://www.sign.ac.uk/>)
 - Etc.

KSHA 2011 Overland Park, KS



5

Forest plot



Our Information Base: What's available

I. ASHA Resources

- a) Compendium of EBP Guidelines and Systematic Reviews – project started in 2005 by national office
<http://www.asha.org/members/ebp/compendium/>
- b) EBP in Comm Dis(2004). Technical Report
- c) Specific to Voice
 - 1) Guidelines = 8
 - 2) Systematic reviews = 12
- d) ASHA Policy documents - Preferred Practice Patterns, Knowledge and Skills

II. Colleagues

III. Yourself – clinical experience and expertise
KSHA 2011 Overland Park, KS



Systematic Reviews Currently Listed Under VOICE on ASHA Website

- **Systematic Review of the Treatment of Functional Dysphonia and Prevention of Voice Disorders**
Ruotsalainen, J., Selman, J., et al. (2008). *Otolaryngology-Head and Neck Surgery*, 138, 557-565.
- **Effects of Voice Therapy: A Systematic Review**
Speyer, R. (2005). *Journal of Voice*, 22(5), 565-580.
- **A Systematic Review of Outcome Measurement in Unilateral Vocal Fold Paralysis**
Baylor, C. R., Yorkston, K. M., et al. (2006). *Journal of Medical Speech-Language Pathology*, 14(1), xxviii-iv.
- **Acid Reflux Treatment for Hoarseness**
Hogarth, G., Youssaf, U., et al. (2006). *Cochrane Database of Systematic Reviews*(1).
- **Botulinum Toxin for Treating Spasmodic Dysphonia (Aryepiglottal Dystonia): A Systematic Cochrane Review**
Watts, C., Nye, C., et al. (2006). *Clin Rehabil*, 20(2), 112-122.
- **Rehabilitation for Parkinson's Disease: A Systematic Review of Available Evidence**
Gage, H., & Storey, L. (2004). *Clin Rehabil*, 18(5), 463-482.



Systematic Reviews Currently Listed Under VOICE on ASHA Website - continued

- **Criteria for Determining Disability in Speech-Language Disorders**
Bisdale, A. K., Watson, L. R., et al. (2002). *AHRO Publication No. 02-E010*. Rockville, MD: Agency for Healthcare Research and Quality.
- **Boon Treatment in Adductor Spasmodic Dysphonia: A Meta-Analysis**
Boutsen, F., Camilo, M. P., et al. (2002). *Journal of Speech, Language, and Hearing Research*, 45, 469-481.
- **Systematic Review of Paramedical Therapies for Parkinson's Disease**
Deane, K. H. O., Ellis-Hill, C., et al. (2002). *Mov Disord*, 17(9), 984-991.
- **Speech and Language Therapy Versus Placebo or No Intervention for Dysarthria in Parkinson's Disease**
Deane, K. H. O., Whurr, R., et al. (2001). *Cochrane Database of Systematic Reviews*(2).
- **Speech and Language Therapy for Dysarthria in Parkinson's Disease: A Comparison of Techniques**
Deane, K. H. O., Whurr, R., et al. (2001). *Cochrane Database of Systematic Reviews*(2).
- **Meta-Analysis of Botulinum Toxin Treatment of Spasmodic Dysphonia: A Review of 22 Studies**
Whurr, R., Nye, C., et al. (1998). *Int J Lang Commun Disord*, 33 Suppl, 327-329.



Guidelines Specific to VOICE - ASHA Website

- **Parkinson's Disease: National Clinical Guideline for Diagnosis and Management in Primary and Secondary Care**
National Collaborating Centre for Chronic Conditions (2006). London (United Kingdom): Royal College of Physicians, 242 pages.
- **Practice Guidelines for Dysarthria: Evidence for the Behavioral Management of the Respiratory/Phonatory System**
Spencer, K. A., Yorkston, K. M., et al. (2006). *Academy of Neurological Communication Disorders and Sciences, Technical Report No. 3*, 50 pages.
- **Practice Parameter: Neuroprotective Strategies and Alternative Therapies for Parkinson Disease (An Evidence-Based Review)**
Sutcliffe, D., Grossi, G., et al. (2006). *Neurology*, 66(7), 976-982.
- **Review of the Therapeutic Management of Parkinson's Disease. Report of a Joint Task Force of the European Federation of Neurological Societies and the Movement Disorder Society-European Section. Part I: Early (Uncomplicated) Parkinson's Disease**
Horstink, M., Tolosa, E., et al. (2006). *European Journal of Neurology*, 13(11), 1170-85.
- **Clinical Practice Guideline: Report of the Recommendations, Motor Disorders, Assessment and Intervention for Young Children (Age 0-6 Years)**
New York State Department of Health, Early Intervention Program. (2006). Albany (NY): NYS Department of Health, Publication No. 4962, 322 pages.
- **RCSLT Clinical Guidelines: 5.13 Head & Neck Cancer**
Taylor-Goh, S., et al. (2005). *RCSLT Clinical Guidelines*. Bicester, Speechmark Publishing Ltd.
- **RCSLT Clinical Guidelines: 5.11 Dysarthria**
Taylor-Goh, S., et al. (2005). *RCSLT Clinical Guidelines*. Bicester, Speechmark Publishing Ltd.
- **RCSLT Clinical Guidelines: 5.6 Clinical Voice Disorders**
Taylor-Goh, S., et al. (2005). *RCSLT Clinical Guidelines*. Bicester, Speechmark Publishing Ltd.



Our Information Base: Are we good at accessing it?

SLPs in general -
Who/what do we tend to use & why?

FORMAT	FREQ	AVG Perceived Helpfulness
Continuing Ed	159/206	Most helpful
Personal Contacts	120/206	Most helpful
Websites and pages	111/206	Less helpful
Books and textbooks	75/206	Helpful
Journal articles	67/206	Helpful
Professional Newsletters	63/206	Less helpful
ASHA Division newsletters	19/206	Helpful
ASHA email discussion lists	18/206	Less helpful

Nail-Chiwetalu & Bernstein Ratner, 2007



Our Information Base: Are we good at accessing it?

SLPs in general - Who/what do we tend to use & why?

- Canadian PTs/Ots – informal consultation with peers = 1st educational resource (Rappolt and Tassone, 2002); “faster”, “more direct”
- Nurses and PTs – primary info sources = clients/patients, personal experience, colleagues (Palfreyman et al, 2003)
- Physicians – clinical experience, review articles, opinion of colleagues (many studies)



Our Information Base: Are we good at accessing it?

- Guo et al, 2008
 - Idaho SLPs (84 of 217 responded)
 - 32% never used library to seek info for clinical decision-making
 - 54% used library less than once a month
 - Majority “looked for info yourself” – various ways; “ask a colleague” next most freq; “contact librarian” and “have secretary search” was third most common

KSHA 2011 Overland Park, KS

13

Our Information Base: Issues and Barriers

I. Issues with the Info Base itself

- a) Breadth – examples – many, many areas where we have little info to look at (at least in the peer-reviewed lit)
- b) Depth – examples – many areas where we have single or small handful of strong studies

II. More basic issue with understanding of voice disorders

- a) Understanding of causes, associated factors
- b) Multi-factorial nature of voice dis – causes, maintaining factors
- c) Disagreement on terms; waste-basket terminology

KSHA 2011 Overland Park, KS

14

Our Information Base: Issues and Barriers

III. Skill at accessing and understanding published work

- 71% of SLPs in UK – difficulty understanding stats (Metcelf et al 2001)
- SLPs not feeling confident about database searching abilities (Guo et al, 2008) – 10% said sufficiently knowledgeable to do MEDLINE search, 5% for CINAHL
- <http://www.nlm.nih.gov/bsd/disted/pubmedtutorial>
- You Tube tutorials
- Work with someone who does this regularly – librarians, professors, co-workers
- Practice, practice, practice

KSHA 2011 Overland Park, KS

15

Our Information Base: Issues and Barriers

IV. Time requirement, jobs get in the way

Nail-Chiwetalu and Ratner (2009): 69% (SLPs)
 Jette et al (2003): 46% (PTs)
 MacEwan et al (2002): “most substantial barrier” (Ots)
 McColl et al (1998): “most substantial barrier” (MDs)

How to address the time issue?

- ultimately makes you a better, more efficient provider if you know the literature
- journal clubs
- on-going part of regular staff meetings

KSHA 2011 Overland Park, KS

16

Our Information Base: Issues and Barriers

V. Perceived need – “we have our ways of doing things”

Studies that include attitudes toward EBP – always a notable % indicating they do not strongly feel the need to regularly re-evaluate their approach

VI. Despair! – all we hear is we don’t have it

Cochran Review homework assignment – experience over the past few years.

KSHA 2011 Overland Park, KS

17

EBP Reminders Not a full tutorial on EBP

I. EBP (many reviews of topic in SLP available – see refs)

- a) definitions (& therefore emphases) differ – examples
- b) A way of thinking to make clinical decisions
 - 1) Weighing of evidence of all types in light of specific clinical situation
 - 2) Client characteristics, desires, goals, etc. play a role
 - 3) Your own abilities, knowledge, job structure also factor in

KSHA 2011 Overland Park, KS

18

EBP Definitions

- ‘The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients’ (Sackett et al, 1997) – most widely used?
- “Evidence based health care is the conscientious use of current best evidence in making decisions about the care of individual patients or the delivery of health services. Current best evidence is up-to-date information from relevant, valid research about the effects of different forms of health care, the potential for harm from exposure to particular agents, the accuracy of diagnostic tests and the predictive power of prognostic” (Oslo, 1996) – emphasis on research

EBP Definitions

- Clinical expertise as part of EBP: ‘...the proficiency and judgment that individual clinicians acquire through clinical experience and clinical practice’ ‘effective and efficient diagnosis; the identification and compassionate use of individual patients’ predicaments, rights, and preferences in making clinical decisions’
 - Sackett et al (1996) - research+client pref+expertise
- ‘Participate in outcomes measurement activities and use data to guide clinical decision making and determine effectiveness of services provided in accordance with the principles of evidence based practice’ – ASHA 2001 – subtle, but recognizes that knowledge base within SLP may not yet allow heavy reliance on literature for all populations served; urges clinicians to measure effectiveness of interventions and be aware of available research

EBP Reminders

Not a full tutorial on EBP

I. EBP – thinking about evidence and making decisions for an individual (Johnson, 2006)

- “willingness to discount opinions of authority... when contradicted by sound scientific evidence” (p.20) – show me attitude
- “focus on the small portion of research that is directly relevant to decisions about practice” (p. 21)
- “judge the quality of research evidence” (p.21)
 - Validity – appropriate scientific methods, minimize bias (e.g., prospective, random assignment, blinding, follow-up on all participants and analysis that accounts for drop outs).
 - Importance – not solely stat signif, rather clinical significance (effect size)
 - Precision – confidence intervals

II. Levels of Evidence: reminder

Table 1. Levels of evidence for studies of treatment efficacy, ranked according to quality and credibility from highest/most credible (Ia) to lowest/least credible (IV) (adapted from the Scottish Intercollegiate Guideline Network, www.sign.ac.uk).

Level	Description
Ia	Well-designed meta-analysis of >1 randomized controlled trial
Ib	Well-designed randomized controlled study
IIa	Well-designed controlled study without randomization
IIb	Well-designed quasi-experimental study
III	Well-designed nonexperimental studies, i.e., correlational and case studies
IV	Expert committee report, consensus conference, clinical experience of respected authorities

From ASHA (2004) Evidence-based practice in communication disorders: An Introduction [Technical Report].

EBP Reminders

Not a full tutorial on EBP

III. Other reminders

- Randomize controlled trials (RCTs)
 - The very basics
 - Randomization
 - Blinding
 - Control groups (no Tx, alternative Tx, delayed Tx)
 - Statistical Analysis Plan
 - Data Monitoring
 - Often sought after, not many done
 - But not the end-all-be-all for our field

A note on RCTs

- **Equipoise** - Before doing an RCT there must be equipoise = genuine doubt about whether one course of action is better than another. - Stolberg et al (2004)
- State of knowledge in which no evidence exists that shows that any intervention in the trial is better than another and that any intervention is better than those in the trial.

EBP Reminders

Not a full tutorial on EBP

III. Other reminders

- b) Systematic Reviews and Meta-analyses – overlapping but not the same
- c) Quasi-experimental studies – what that might look like

KSHA 2011 Overland Park, KS

25

EBP Reminders

Not a full tutorial on EBP

III. Other reminders – continued

- d) Correlational & case studies
- e) Resurgent focus on contributions of well done case studies and other qualitative approaches – complimentary to RCTs and other studies; rich data sets

COMBINATIONS OF STUDY designs to provide a rich and informative data set

KSHA 2011 Overland Park, KS

26

EBP Reminders

Not a full tutorial on EBP

IV. SLP attitudes and use of EBP (Zipoli & Kennedy, 2005)

- a) Generally positive attitude
- b) Predictors of SLP attitude toward EBP and research
- c) Utilization of EBP and Research
- d) Predictors of SLP use of EBP and research

KSHA 2011 Overland Park, KS

27

Voice Treatment:

“Functional Dysphonia” (Teachers & non-Teachers)

I. What the literature says for non-Teachers

- a) Ruotsalainen et al (2007) – Cochrane Review
And
- b) Ruotsalainen et al (2008) – systematic review in Otolaryngology –Head and Neck Surg

KSHA 2011 Overland Park, KS

28

Forest Plot –intervention vs. no intervention

Interventions: no therapy/therapy of dysphonia in adults
Comparison: 01: Intervention vs. no intervention
Outcome: 01: Favoring intervention

Study or Sub-Category	n	Intervention Mean (SD)	Control Mean (SD)	SMD (random) 95% CI	Weight %	SMD (random) 95% CI
01: Indirect voice therapy, no intervention (FDQ/other interventions)						
Carney 2005	15	29.20 (14.99)	31.20 (14.49)	-0.80	100.00	-0.80 [-1.24, -0.37]
Subtotal (FDQ)	15			-0.80	100.00	-0.80 [-1.24, -0.37]
02: Combined direct and indirect voice therapy, no intervention (FDQ and VROU)/other interventions						
Carney 2005	15	27.80 (16.34)	31.20 (14.49)	-1.68	100.00	-1.68 [-2.46, -0.91]
O'Brien-McCoy 2005	7	30.00 (16.28)	31.20 (14.49)	-1.20	20.00	-1.20 [-2.28, -0.12]
Malhotra 2007	17	22.40 (11.20)	31.20 (14.49)	-2.40	100.00	-2.40 [-3.17, -1.63]
Sullivan/Orlitzky 2005	21	22.40 (11.20)	31.20 (14.49)	-2.40	100.00	-2.40 [-3.17, -1.63]
Teacher overall (I ² =0.0%, P=0.93), n=77/76				-2.07	100.00	-2.07 [-2.94, -1.20]
03: Combined direct and indirect voice therapy, no intervention (FDQ) (follow up: 16 weeks)						
Malhotra 2005	17	22.40 (11.20)	31.20 (14.49)	-2.40	100.00	-2.40 [-3.17, -1.63]
Subtotal (FDQ)	17			-2.40	100.00	-2.40 [-3.17, -1.63]
Teacher overall (I ² =0.0%, P=0.93), n=77/76				-2.07	100.00	-2.07 [-2.94, -1.20]

Favor intervention Favor control

- Some details ...
- Overall –
 - moderate evidence for effectiveness of combo direct/indirect Tx vs no intervention and moderate evidence that the effects can be long lasting
 - “Poor study quality”
 - Also reviewed controlled non-randomized studies – two others had results consistent with positive outcome from combo Tx; one other found hydration have positive impact

KSHA 2011 Overland Park, KS

29

Voice Treatment:

“Functional Dysphonia” (Teachers & non-Teachers)

I. What the literature says for non-Teachers

Bos-Clark & Carding (2010) – narrative review of lit post 2007 Cochrane

--not much more to add re: non-teachers

KSHA 2011 Overland Park, KS

30

Voice Treatment:

“Functional Dysphonia” (Teachers & non-Teachers)

II. What the literature says for Teachers

- b) Ziegler et al (2010) – systematic review focused on behavioral intervention studies (not just RCTs); 1998-2008; Pubmed only

N=74 initially; 11 within the decade of interest

Classified studies

1. Direct vs indirect Tx
2. single vs multiple tx approaches utilized
3. type of tx (VFE, reson vc tx, VH, other, combos)
4. individual vs. group

31

Voice Treatment:

“Functional Dysphonia” - TEACHERS

- INDIRECT TX
 - Vocal Hygiene
 - Roy et al 2001
 - Niebudek-Bogusz et al 2008
 - Voice Amplification
 - Roy et al 2002
 - Roy et al 2003

KSHA 2011 Overland Park, KS

32

Voice Treatment:

“Functional Dysphonia” - TEACHERS

- DIRECT TX
 - Vocal Function Exercises
 - Single Tx Approach
 - Roy et al 2001 +
 - Pasa et al 2007 -
 - Nguyen and Kennedy 2009 (teachers with MTD = +)
 - Combined with other approaches
 - Gillivan-Murphy et al 2006 +
 - Niebudek-Bogusz et al 2008 +

KSHA 2011 Overland Park, KS

33

Voice Treatment:

“Functional Dysphonia” (Teachers & non-Teachers)

II. What the literature says for Teachers – Resonant Voice Therapy

- Roy et al 2003 (RCT)
- Chen et al 2007
- Bovo et al 2007
- Niebudek-Bogusz et al 2006

34

Voice Treatment:

“Functional Dysphonia” (Teachers & non-Teachers)

OVERALL . . .

a) What does the literature suggest – are we at 1a/b level of evidence ?

b) Comfort level in making clinical decisions with the literature we have?

KSHA 2011 Overland Park, KS

35

Voice Treatment:

Muscle Tension Dysphonia

Quick comment on MTD – subset of functional dysphonia, psych, secondary to...

- I. Van Houtte et al (2010) – systematic review; careful – though
- II. Roy et al (1997) – laryngeal massage

36

Voice Treatment: Muscle Tension Dysphonia

II. Van Lierde et al (2008) – breath support vs. laryngeal massage

Voice Treatment: Muscle Tension Dysphonia

IV. Mathieson (2011) – laryngeal massage

V. Nguyen and Kennedy (2009) – vocal function exercises

Voice Treatment: Muscle Tension Dysphonia

Overall . . .

a)What does the literature suggest? IIb level?

Some evidence that MCT is effective but not as strong as we'd like; not very extensive literature base; no RCTs; mostly single treatment, pre-post studies; pretty clear that you can get immed change in most folks; not clear how long the effect might last

Not totally clear why the tx might work though the authors provide some rationales; not clear if one method of massage better than another

a)Comfort level in making clinical decisions with the literature we have?

Voice Treatment Paradoxical Vocal Fold Motion

Comment on the condition:

- The terms
- Do we know what it is? And are we lumping folks together with variety of causes?
- Controlling causative, precipitative and maintaining factors vs. behavioral Tx

From Murry and Sapienza, 2010

Terminology collected from recent literature describing symptoms associated Paradoxical vocal fold motion, chronic cough, or laryngospasm.

	Paradoxical Vocal Fold Motion	Chronic Cough	Laryngospasm
Vocal cord dysfunction	X		X
Muchausen's stridor	X		
Functional airway obstruction	X	X	X
Paradoxical vocal cord dysfunction	X	X	X
Episodic paroxysmal laryngospasm	X		X
Adult onset asthma	X	X	X
Facilitous asthma	X		
Paradoxical vocal fold movement	X	X	X
Breathing abnormalities	X	X	X
Psychogenic stridor	X	X	X
Irritable larynx syndrome	X	X	X
Laryngeal dyskinesia	X		X
Trigeminal neuralgia	X	X	X

PVFM treatments that have been suggested

- Quiet rhythmic breathing
- Breathing with vocal resistance
- Pulsed exhalation
- Abdominal focus at rest

Voice Treatment

Paradoxical Vocal Fold Motion

- Murry, Tabee & Aviv (2004) – case series involving respiratory retraining (next slide)
- Sullivan et al (2001) – case series with female athletes
- Mathers-Schmidt (2001) – description of approach, 2 case studies

KSHA 2011 Overland Park, KS

43



Voice Treatment

Paradoxical Vocal Fold Motion

I. Murry et al (2006) – respiratory retraining

Significant improvement in subject ratings of sx (cough and others); some PFT measures also improved

Speculated that PVFM = heterogenous group of disorders with common clinical manifestations; possible that the 20 in this study – all presenting with CC as primary sx – may represent a subgroup of PVFM that is tied closely to LPS

KSHA 2011 Overland Park, KS

44



Voice Treatment:

Paradoxical Vocal Fold Motion

Overall . . .

- a) What does the literature suggest? Level III and IIb
- b) Comfort level in making clinical decisions with the literature we have?

KSHA 2011 Overland Park, KS

45



Final Comments

I. Commitment to change your thinking

II. Commitment to change your practice

- a) Time = the biggest identified enemy
- b) Insecurity . . . paralysis . . . blissful unawareness...

KSHA 2011 Overland Park, KS

46



Final Comments

III. Get the skills

- a) Lit searching (not just internet searching) – where to learn it? What to look for?
- b) Evaluation of a study – where to learn it? from whom?
- c) Self-reflection on your practice patterns and clinical decision making

KSHA 2011 Overland Park, KS

47



Final Comments

IV. Set-up avenues for staying up to date

- a) "Informal" peer groups – face-to-face, on-line
- b) Journal clubs, study groups, SIGs
- c) Know what ASHA has gathered already
- d) Set up key journals to send you Table of Contents at each publication
- e) Carve out some time somewhere – get superiors to buy in (quality of care, reimbursement, etc.)
- f) Partner with researchers
- g) More...

KSHA 2011 Overland Park, KS

48

