Clinical Outcomes and Evidence Based Practice in Neurogenic Communication Disorders: A Single -Subject Perspective

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Clinician-Scientist

(Scientist Practitioner: Barlow, Hayes & Nelson (1984;1999)

• Consumers of research
  – Evaluate, compare studies and levels of evidence

• Accountable clinicians
  – Incorporate measurement principles in tx

• Research collaborators
  – Movement toward “Practice Based Evidence”
Purpose

• Discuss the rationale and need for clinicians to become better research consumers
• Briefly discuss single-subject experimental designs - the most prevalent methods for investigating aphasia treatment efficacy
• Clinicians who understand SS methods may become better research consumers and EB practitioners
Aphasia Treatment Efficacy

• Over 900 studies of interventions for aphasia

• Meta analyses of the literature support the conclusion that language intervention for aphasia is efficacious (Robey et al 1994; 1998; 1999)

• Treatments have been guided by a variety of rationales and theories including:
  – psycholinguistic, cognitive neuropsychological and models of oral / written naming, sentence comprehension and production, pragmatic, minor hemisphere mediation etc.
  – Pharmacological and neurological interventions are also being explored
Resources:

ANCDS Practice Guidelines Committee EBP web: (http://aphasiatx.arizona.edu/)

National Rehabilitation Information Center
www.narc.com

National Center for Evidence Based Practice in Communication Disorders (N-CEP; ASHA)
(www.asha.org/members/ebp/compendium)
EB Limitations

Kazdin (2004)

- Evidence from well controlled studies may not generalize to clinical settings
  - Settings; recruitment; selection of pts, tx; assessment; interventionist

- Criteria for demonstrating EB are not sufficiently stringent
  - Statistical vs clinical significance; most tx works vs none
National Academies Roundtable on EBP (2007; executive summary)

• **Challenges:**
  - The prevailing approaches to obtaining clinical evidence is currently inadequate and maybe irrelevant tomorrow. Over dependence on RCTs

  - Approaches to interpreting evidence and producing practice guidelines yield inconsistencies and confusion.
    * E.g. Cochran Review of aphasia restricted to RCTS
Evidence Based Practice

• Levels of evidence are difficult to judge
• Experience and training often dictate treatment
• Perspectives of stakeholders vary and may influence clinical implementation
  - researcher; clinicians; patients; payors
Conclusion

• Aphasia treatment compendiums and guidelines are helpful but not sufficient for developing evidence based clinical practice

• Clinician-Scientists must developed the skills to become better research consumers
Clinician Scientists as Research Consumers

• Single subject experimental designs are currently the most prevalent methodology used for aphasia treatment research
  – Kearns & Thompson (1991)
  – Thompson (2006) (AJSLP; Aph; B & L; JSHR)
• 2000- 2005: N = 81
• OA: 49% ss studies;
  – 11% group studies. Surprising increase the number of case studies.
• Quality issues persist.
Single-subject experimental designs and clinical practice:

- SS designs examine important treatment questions

- Experimental not observational (not case studies)

- Phases, graphing of outcomes, and detailed descriptions of subjects and treatment facilitate clinical interpretation and use
Common SS Design Strategies
(Kearns, 2000)

- **Treatment vs No-treatment comparisons**
  - examine efficacy of treatment relative to no tx

- **Component Assessment**
  - relative contribution of treatment components

- **Successive Level Analysis**
  - examine successive levels of treatment

- **Treatment - Treatment Comparisons**
Single-subject experimental designs

• *Experimental Control*:
  - Subjects generally serve as their own control and receive both non-treatment (baseline) and treatment conditions.
  - Juxtaposition of Baseline (A) and Treatment (B) phases provides mechanism for experimental control.
  - Control is based on within and across subject comparisons and replication; believability.
  - All subjects receive both treatment and no-treat conditions.
Treatment vs No-treatment Comparisons

- Multiple baselines and variants most common and practical designs
  - MB across behaviors: w/i subject comparison of one treatment applied to two or more (similar) targets
    - Baseline both target behaviors
    - Tx is staggered across targeted behaviors
    - Baseline continues for the untreated target to serve as control comparison w treatment
    - Once criterion is met for the first target, then tx is applied to the second to replicate tx effect
WWC Evidence Standards: SS Designs Evidence
(Kratochwill et al., 2010: http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf)

- Three convincing demonstrations of an effect through visual-graphic analysis
  - Level, trend, variability, immediacy of the effect, across phases, data overlap, consistency of patterns of across similar phases
Multiple-Baseline: Across Behaviors

**Behavior 1**

A

B

**Behavior 2**

A

B

**PERCENT CORRECT**

**SESSIONS**
Single-subject experimental designs

- Analysis Assumptions:
  - Powerful treatment effects are visually obvious
  - Statistical analyses assist in teasing out trends especially when variability is high or treatment effects are not visually obvious
  - Both visual analysis and statistical analysis are interpretative aids
  - Drunk and the lamp post..
Visual Analysis

- Within and across phases
  - Level (on the ordinate; %..)
  - Trend over time. Slope of line of best fit (stable, increasing, decreasing)
  - Variability – range or variability around best fit line
  - Immediacy of treatment effect
  - Overlap across phases
  - Consistency of data pattern across adjacent and similar phases
(Thompson, Kearns, Edmonds, 2006)
Figure 17-8. Mean number of content words produced for training (top, middle) and generalization items (bottom) for subject R.W.
Summary

- Aphasia treatment compendiums and guidelines are helpful but not sufficient for developing evidence based clinical practice.
- Clinician-Scientists must develop the skills to become better research consumers.
- SS designs are prevalent and accessible to clinicians.
- Clinicians who understand SS methods may become better research consumers and EB practitioners.