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Pittsburgh, PA

Evidence Based Practice:
Methods of Appraising Literature
Methods of Generating Evidence

James L. Coyle, M.A., CCC- SLP
Clinical Instructor, Communication Science and Disorders
University of Pittsburgh

What is Evidence Based Practice?

1. See a Patient
 - a. Thorough Inventory
2. Ask questions
 - a. Background questions
 - i. Define all aspects of the patient's problem
 - b. Foreground questions
 - i. P-patient and problem
 - ii. I- intervention or test of interest
 - iii. C- comparison (if relevant)
 - iv. O- outcome of interest
3. Seek the best evidence for the question
 - a. Literature search
 - b. Hand search
4. Appraise the evidence
 - a. Type of investigation

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| <ol style="list-style-type: none">I. Systematic Review of Multiple well designed RCT's
N of One RCTII. Randomized Control Trial of adequate sizeIII. Well designed trials (control group): individual non-randomized trial,
cohort studies, time series, well matched case-control studiesIV. Well designed individual studies (no control): from more than one
research centerV. Expert opinion (self evident), case study, others not fitting I-IV
evidence level |
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- b. Validity-investigations of therapy techniques
 - i. Randomization with concealment
 - ii. Sufficiently long and complete follow up
 - iii. Intention to Treat (attrition)
 - iv. Blinding of judges, patients to assignment
 - v. Equal treatment outside experimental protocol
 - vi. Groups similar at start of trial
- c. Validity-investigations of diagnostic techniques
 - i. Independent, blind comparison with reference (gold) standard
 - ii. Appropriate spectrum of patients investigated
 - iii. Test is validated in a second independent trial of similar patients
- d. Importance of the Valid Investigation's Results
 - i. Statistically and clinically significant
 - 1. Sufficiently robust p values
 - 2. Treatment-NNT, Risk Reduction, Effect Size
 - 3. Diagnosis-Sensitivity, Specificity, Predictive Value, Likelihood Ratios
- e. Applicability of Valid, Important Investigation's Results for Our Patient
 - i. Is the method feasible in our setting?
 - ii. What are the potential benefits and harms to the patient?
 - 1. Do benefits justify potential for harm?
 - iii. Is our patient similar to subjects?
 - 1. If not: does the method make clinical and biological sense?
 - 2. If not: is the difference both clinically and statistically significant?
 - 3. If not: was the difference hypothesized before the study began or discovered through data dredging?
- 5. Apply the Evidence
 - a. Single Subject Methodology
 - i. Visual inspection of data generated during treatment
 - ii. Methods that use more defensible data analysis in ascending order of power (they are not hard to do!!!)
 - 1. Celeration Line

- a. Combines visual inspection with predictive “trend” line, using baseline phase to predict change that would have occurred without intervention
2. Two Standard Deviation Band Method
 - a. Combines Gaussian patterns of normal distributions with visual inspection. Patient is his own normal distribution reference.
 - b. Significant Differences ($p \leq 0.05$) identified when contiguous data points during intervention phase fall beyond ± 2 SD of baseline mean.
 - c. Requires minimum of 8 data points per phase
 - d. Serial dependency (baseline autocorrelation) ruled out first
3. C Statistic
 - a. Statistical method comparing baseline data to intervention phase data.
 - b. Identifies trend in baseline and overall data set.
 - c. Fewer data points per phase are acceptable
 - d. Produces Z score (probability that difference produced by treatment occurred by chance)
4. N of One Clinical Trial
 - a. Requires the same rigor indicated above in #4.
 - b. Control is identical to subject; applicability of result is nearly impossible to refute.
 - c. However...they may require IRB approval if an experimental method is proposed.
6. Monitor the Change
 - a. Methods noted above (5) include techniques for monitoring, measuring generalization, maintenance of treatment effects.

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J. L. Coyle
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