

TEACHING EVIDENCE BASED PRACTICE

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I. Proposed Agenda

- A. Examine teaching evidence-based practice (EBP) from a curricular perspective
- B. Examine the interaction of students and EBP
- C. Examine the skills to be taught
- D. Examine the understandings to be taught
- E. Examine a variety of learning activities for developing understandings and skills in carrying out each of the major steps of evidence-based practice
 - 1. Forming a clinical question
 - 2. Identifying and accessing evidence for answering clinical questions
 - 3. Conducting critical appraisals of scientific evidence
 - 4. Integrating current best evidence with clinical expertise and client values
 - 5. Evaluating self as an evidence-based practitioner
- F. Answer the questions we have along the way and set aside some time for more questions at the end of our session.
- G. Changes?

II. Learner Outcomes

- A. Participants will identify a teaching strategy for teaching evidence-based practice (EBP).
- B. Participants will identify a potential project as learning experiences for students.

III. EBP in a Curriculum

- A. Position early in the curriculum that course in which primary instruction occurs.
- B. Resonate the primary instruction in professional courses
- C. Resonate the primary instruction in clinical-education experiences
- D. Incorporate EBP perspectives in summative evaluations

E. A few examples of learner outcomes for students

1. Form answerable clinical questions.
2. Conduct thorough searches for scientific evidence bearing on clinical questions.
3. Critically appraise the validity of scientific evidence as it relates to a particular client.
4. Counsel clients with respect to high-quality choices in determining a course of care.
5. Appropriately evaluate self regarding EBP skills
6. Relate forms of clinical research to forms of clinical evidence (e.g., efficacy, effectiveness).
7. Explain the ethical and professional issues underpinning clinical decisions.

IV. Students and EBP

A. What do students want to know about EBP?

1. Just what is evidence-based practice?
2. What activities make up EBP? What is the process?
3. Should I be thinking about EBP in my clinical assignments? Is that a realistic goal?
4. Is EBP practical the workplace?
5. Must I apply this process in everything I do?
6. What happens when there isn't much in the way of external evidence?

B. What understandings do students need prior to primary instruction in EBP?

1. Standard scores
 - a. z score
 - b. T score
 - c. Stanine
 - d. Normal curve equivalent
 - e. Age equivalent
 - f. Grade equivalent

2. Percentile
3. p , α , $1-\beta$, n
4. Effect size
 - a. d
 - b. Likelihood ratio
 - c. Relative risk ratio
 - d. Odds ratio
 - e. Sensitivity, specificity, post-test probabilities
5. Standard error
6. Standard error of measurement
7. Confidence interval
8. Standard scores
9. Reliability
10. Validity

C. How do students respond to EBP?

Like all perceptions, these can't be known and they likely vary greatly. That said, I've witnessed a sense of independence and autonomy through informed decisions.

V. The Skill Set to be Taught

A. The skill set for mode 1: I'll do it myself.

1. Find and access all the literature for relevant and best-available clinical information
2. Critically assess that evidence for validity and usefulness to the client and practice

B. The skill set for mode 2: I'll take advantage of resources, thank you.

1. Find, access, and assess systematic reviews
2. Find, access, and assess meta-analyses
3. Find, access, and assess clinical practice guidelines

C. The skill set for both modes

1. Ask answerable clinical questions
2. Understand the unique circumstances of a particular client and the interrelationship between evidence and client
3. Relate external evidence to clinical application, e.g., Is it relevant for this client? Is it valid? How does it apply in this circumstance?
4. Communicate clearly with clients
5. Help a client weight intervention alternatives
6. Facilitate a consensus decision
7. Implement a selected protocol competently
8. Evaluate self as an evidence-based practitioner
9. Make EBP practical - Dollaghan (2004) is a very good reading here.
 - a. Look for evidence in all the right places
 - b. Set up an alerting service and triage the alerts
 - c. Affiliate with professional groups (in your area of clinical focus) that are working to support clinicians.
 - d. Achieve 'realistic' through focus and discipline.
10. Know where to find help
 - a. STARD, CONSORT, TREND, MOOSE, QUORUM
 - b. Web-based tutorials
 - c. Web-based forms and work sheets
 - d. Web-based calculators
 - e. Web-based archives of clinical treatment guidelines
 - f. NIH
 - g. COCHRANE
 - h. PubMed cubby
 - i. AGREE
 - j. ASHA web pages

VI. The Understandings to be Taught

- A. Ultimately, EBP is about individuals with communication disorders perceiving important and meaning changes in their lives brought about by our clinical interventions.

⇒ EBP is client specific

B. As a means to that end, EBP is about a single and certain clinician identifying a single and certain clinical decision that she would like to improve in her clinical practice.

⇒ EBP is clinician specific

⇒ EBP is clinical-action specific

1. As a result, what one clinician is doing in terms of EBP may be very different than what another clinician is doing.

2. A clinician may want to improve more than one clinical decision, but the point is that EBP is a focused and disciplined activity. It isn't about learning all there is to know about everything aspect of clinical practice.

⇒ EBP is focused learning; it is the result of a choice for self.

⇒ EBP is a process for filling a self-determined gap in one's clinical knowledge or skill.

C. Broadly considered, EBP is a means for improving the quality of decisions in all aspects of clinical practice, e.g.,

1. Prevention

2. Safety

3. Measurement technologies for assessing communication status

4. Screening

5. Diagnosis

6. Prognosis

7. Treatment efficacy

8. Treatment effectiveness

N.B.: The term intervention is used in the broadest sense.

D. EBP is a means of managing uncertainty

1. There a very few things we know for certain.

2. In the absence of absolutes, the best we can do is make decisions with as clear an understanding of the uncertainties as is possible.
3. EBP is a process for making informed and rational decisions in an uncertain world.

Example from class:

- a. One diagnostic protocol has sensitivity of .80, specificity of .80, and a LR+ of 6.0.
- b. A competing protocol has sensitivity of .90, specificity of .90, and LR+ of 18.0
- c. Is either test so flawed that it is rendered useless?
- d. Is either test guaranteed to 'get it right' every time?
- e. Within that context, in using which test do we best manage the uncertainty?

⇒ EBP is not about uncovering the one correct thing to do; it's about doing one or another of the best things under the circumstances in which a choice must be made.

E. EBP is the integration of ... (adapted from Straus, et al., 2005)

1. Current best evidence with
2. Clinical expertise
3. Client values (e.g., preferences, concerns, and expectations)
4. Client circumstances (e.g., individual clinical picture, individual circumstances, intervention ecology)

In consultation with the client, EBP integrates best evidence and clinical expertise, to decide upon an option for intervention on a case-by-case basis.

F. EBP comprises five steps (adapted Straus, et al., 2005)

1. Identify a need for clinical information to improve the quality of clinical decisions and express that need as an answerable clinical question particularizing four dimensions.
 - a. Population

- Children with chronic otitis media
- Individuals with aphasia resulting from a first stroke
- Individuals presenting with middle-stage dementia of Alzheimer's Disease
- Adult females with diagnosed bilateral vocal nodules
- Individuals with profound sensorineural hearing loss
- Adults presenting with multiple cranial-nerve flaccid dysarthria
- Individuals with unilateral vestibular dysfunction

b. Intervention

- Melodic intonation therapy
- Hearing screening at .5, 1, 2, and 4 kHz at 25 dB HL with accompanying tympanogram
- A certain aural-rehabilitation protocol
- Assessing the appropriateness of a certain alternate-communication device
- Placing an FM sound system in a classroom
- Prognosis for functional independence in swallowing with an unrestricted diet.
- Differential diagnosis of language delay

c. Comparative intervention (if appropriate)

- Cochlear implantation
- Vocal surgery
- Examination by a psychologist
- Melodic intonation therapy
- Examination by a family counselor
- Loose-training for non-fluent aphasic individuals
- A certain speech-supplemental protocol for dysarthria

d. Outcome

- Phonation absent pathologic signs in terms of f0, jitter, shimmer, and S/N ratio
- Phonation judged perceptually acceptable
- Elimination of vocal nodules
- Ninety-percent intelligibility assessed through strangers
- Return to work
- Discharge to independent living
- Independent feeding
- Entering a mainstream Kindergarten class on schedule
- Reading on grade level
- Improvement of 2 or more FCM points
- Academic achievement
- Improved quality of life
- Satisfaction with hearing-aid fit

Population, Intervention, Comparative Intervention, Outcome: PICO

2. Find and access all the literature for relevant and best-available clinical information
 - a. Medline
 - b. [Cochrane Database of Systematic Reviews](#)
 - c. PsychLit
 - d. EMBASE
 - e. Social Science Citation Index
 - f. ERIC
 - g. CINAHL (Cumulative Index to Nursing and Allied Health Literature)
 - h. [DARE \(Database of Abstracts of Reviews of Effects\)](#)
 - i. PubMed
 - j. Google Scholar
 - k. Medscape
 - l. Findarticles.com
 - m. ScienceDirect
 - n. ComDis Dome
 - o. The ASHA website

3. Critically appraise that evidence for appropriateness and validity for a client and practice.
 - a. Relevant
 - b. Valid
 - c. Reliable

4. Present each client with highest-quality choices and, together, determine a course of care.
 - a. Understand the unique circumstances of a particular client and the interrelationship between evidence and client
 - i. Personal values, concerns, and expectations
 - ii. Personal preferences reflecting cultural or ethnic values
 - b. Communicate clearly with a client
 - c. Help a client weight intervention alternatives among best-practice options
 - d. Facilitate consensus decisions
 - e. Implement the selected protocol competently
 - f. Evaluate the effectiveness of the outcome

5. Self-evaluate performance as an evidence-based practitioner.
 - a. Self-evaluate performance on steps 1 through 4
 - b. Write a prescription for self: How I will improve my ___ EBP skill next time

G. EBP is a continuing process.

What was a best intervention choice for the last client is not necessarily the best choice

for the next client. We must evolve and adapt all aspects of the EBP process as new evidence becomes available. EBP is a dynamic integration of ever evolving clinical expertise and external evidence in day-to-day practice.

H. EBP outside of universities is different than EBP in universities.

Many students graduate into clinical settings that do not subscribe to scientific literature archives.

VII. The Results of a Faculty Survey Conducted by Division 2 of the American Speech-Language-Hearing Association, Randall Robey, Patrick Coppens (Chair), Katherine Ross, Margaret Greenwald, Kristie Spencer, Janet Patterson, Barry Slansky (2005)

A. How do you teach: Asking answerable clinical questions?

- Doing it. Deciding on a clinical question, carrying out the remaining steps, examining the quality of the clinical decision relative to the quality of decisions obtained through other means.
- Discussing a specific client's behaviors, strengths, and needs and then developing a prescription for learning.
- Assigning several projects to determine PICO elements and write corresponding clinical questions.

B. How do you teach: Searching for best-current evidence?

- Conducting literature reviews with electronic databases such as the Dome.
- Accessing articles from the ASHA website.
- Examining resources on the ASHA web pages.
- Assigning searches for evidence regarding a certain clinical question.
- Posting successful search strategies (created by students) on the class web page.
- Demonstrating searches in class (by instructor) using a variety of electronic databases.
- Grading search strategies by predetermined criteria for sensitivity and specificity.

C. How do you teach: Critically appraising evidence?

- Assigning small groups of students to present a summary and critical analysis of a study.
- Asking students questions about the appropriateness, validity, and level of evidence of studies relating to their clinical practice.
- Talking the students through studies or reviews examining appropriateness and validity of each.
- Having students pinpoint strengths and weaknesses of research studies through annotated bibliographies and group discussions.

D. How do you teach: Integrating best-current evidence in making clinical decisions?

- Asking students to formulate intervention options for a case on the basis of the critical appraisal.
- Having groups of students recommend intervention options for a case based on a critical analysis of the evidence.
- Posing a set of questions requiring clinical decisions based on the analysis of evidence.
- Applying the principles of EBP to the cases they must manage under our supervision in clinic.
- Working through a collaborative-problem-solving process with interjections of clinical experiences.

E. How do you teach: Integrating clinical expertise in making clinical decisions?

- Asking students to consult with clinical instructors and professors regarding their clinical experiences.

F. How do you teach: Integrating client values, culture, preferences, and concerns in making decisions?

- Ongoing discussions concerning family/client perspectives, priorities, resources, strengths and needs.

- Presenting intervention options (with counseling) to another student role-playing a client with a known case history.
- Assigning students to write a script of a clinician's presentation to a client as an extension of a case study.
- Encouraging students to have conversations with clients to better understand an individual's values.
- Using specific case studies, examine a certain clinical decision varying cultural diversity, linguistic diversity, age of clientele, type of work setting, and so forth.

G. How do you teach: Self-evaluating the quality of one's own EBP skills?

- Asking students to evaluate their skills and their progress in written assignments or through oral presentations before class.
- Asking students to evaluate their skills and their progress in oral reports before clinical instructors regarding clinical cases at mid-term as well as at the end of each semester.
- Asking students for ongoing self-analysis regarding the planning and the focus of treatment as well as approaches, principles, and outcomes.

H. In what types of learning fora do you teach EBP?

- 31% A clinical seminar
- 31% A clinical practicum
- 75% Topical courses in communication disorders (e.g., aphasia, motor speech disorders)
- 56% A research or statistics course
- 12% Other (an undergraduate course; Ph.D. course)

I. What is the most effective forum for teaching EBP?

- Classroom lectures augmented with small group or individual learning activities
- Clinical practicum
- A combination of classroom instruction and practicum experience

J. What are helpful teaching resources?

- Websites

Agency for Healthcare Research and Quality
<http://www.ahrq.gov/>

Annals of Internal Medicine
<http://www.annals.org/cgi/content/full/126/5/376>

Appraisal of Guidelines Research Evaluation
<http://www.agreecollaboration.org/>

ASHA website
<http://asha.org/members/ebp/default>

Centre for Evidence-Based Medicine
<http://www.cebm.net/index.asp>

Child Language Data Exchange System
<http://childes.psy.cmu.edu/>

Cochrane Collaboration
<http://www.cochrane.org/index0.htm>

CONSORT Statement
<http://www.consort-statement.org/>

National Guideline Clearinghouse
<http://www.guideline.gov/>

NY State Education Department
<http://www.nysed.gov/>

PA Department of Education
<http://www.pde.state.pa.us/>

PubMed
<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi>

STARD Statement
<http://www.consort-statement.org>

TREND Statement
<http://www.trend-statement.org/asp/trend.asp>

- Articles and Books

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