The Enigma of Evidence-Based Practice: Are We Really Evidence-Based in Our Practice?

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Definitions of EBP

EBP is defined as “the integration of best research evidence with clinical expertise and client values.”

Evidence-based medicine is the “conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients.”

Definitions of EBP in Nursing

Evidence-based nursing:
A process of finding, appraising and applying a scientific evidence to the treatment and management of health care.

Evidence-based practice:
Method of problem-solving that involves identifying a clinical problem, searching the literature, evaluating the research evidence, and deciding on the intervention.
Confusion about Research Utilization (RU) and EBP

- RU & EBP are often used interchangeably, but they are not synonymous
- EBP is a more general term encompassing evidence broader than research findings and thus includes RU
- EBP includes the preferences and values of the patient & family in the process
  - While clinicians may utilize the best evidence available, the application and outcomes can differ based on the patients’ values, preferences, concerns, and expectations

Factors Influencing Use of Research in Practice

**Facilitators**
- Clinical relevance
- Environment
- Resources
- Academic/practice links
- Access to literature

**Barriers**
- Research-related
- Organizational
- Nurse-related
- Professional
Translating Research and Evidence into Practice

- While we have a growing evidence base, knowledge does not appear to be efficiently translated into practice
- One reason may be that the implementation of evidence into practice is not like the “flow of water” from researcher to practitioner
- It’s more like a “contact sport” necessitating challenge, negotiation, and overcoming various boundaries, objects & players (Greenlaugh et al., 2004)

Types of Practice

- Research-based Practice
- Best Practice
- Knowledge-based Practice
- Data-driven Practice
- Evidence-based Practice

Research-based Practice

- Application of findings from a study(s) that:
  - is well-designed
  - is of acceptable quality
  - has meaningful results
  - has findings that are generalizable
  - can or has been replicated
Best Practice

• Practice defined by regulatory, accreditation agencies, and professional standards
• Practice that may not have compelling evidence or research to support it
• Practice that has tradition and an extensive documentation of proven effectiveness
• Practice based on sound rationales and "good clinical sense"

Examples:
• assess pain regularly
• inform patients of their rights to adequate pain control

Knowledge-based Practice

• Derived from information from:
  • textbooks
  • educators
  • educational programs
  • experience
• Knowledge-based practice is not always EBP!

Data-driven Practice

• Internal validation studies/projects
• Performance Improvement (PI) initiatives/projects
• Benchmarking studies/projects
EBP, Best Practice and Data-Driven Practice

- Utilize Levels of Evidence to appraise the quality of literature and adopt changes in practice
- Re-evaluate the need for change in practice
- Develop evidence-based clinical decision tools
- Monitor Nursing-Sensitive Quality Indicators and redesign care to improve outcomes
- Integrate evidence-based information in the computerized health information systems
- Establish mechanisms for data/outcomes reporting, monitoring and tracking
- Incorporate national clinical care guidelines into routine practice
- Establish targets for quality care and patient safety using standards from regulatory and accreditation agencies, external benchmarks and internal comparators


Hierarchy of Pre-processed Evidence

- Examples
  - System
  - Summaries
  - Synopses of Evidence
  - Syntheses
  - Synopses of Single Studies
  - Single Studies

Hierarchy adapted from Haynes, 2007

DARE: Database of Abstracts of Reviews of Effects

www.crd.york.ac.uk/crdweb/
Systems that Support EBP: Clinical Decision Support Systems (CDSS)

“Decision support services that match information from individual patients with the best evidence from research that applies.”
(Haynes, 2007)

Do CDSSs Improve Practitioner Performance? Results of a Systematic Review

- 48 of 71 (68%) CDSS demonstrated practice improvements
- 75% of interventions succeeded when the decision support was provided to clinicians automatically, whereas none succeeded when clinicians were required to seek out advice from the system
- Integrated systems of charting or order entry systems were more successful
- Take home message?


Levels of Evidence

- Meta-Analyses
- Systematic Reviews
- Well-designed Experimental Studies (RCTs)
- Well-designed Nonexperimental Studies
- Observational Descriptive Studies
- Expert Consensus
- Published Case Reports and Clinical Examples
The Strongest Level of Synthesis: A Meta-Analysis

- An exhaustive review of the literature
- An integration of results to:
  - Examine research studies and pool data for statistical analyses
  - Formulate statistical conclusions about contradictory research-based information
  - Answer important questions about practice
  - Generalize conclusions

Systematic Reviews

Systematic consolidations of the literature on a specific topic:

- Comprehensive identification of studies
- Review of study relevance
- Evaluation of methodological quality
- Extraction of data
- Analysis of data
- Drawing conclusions

Systematic Reviews

Advantages

- Identifies pertinent research
- Compiles published research according to:
  - specific areas of study
  - historical or chronological evaluation
- Uncovers deficient areas of research

Disadvantages

- May be biased
- May not be exhaustive
- Lacks criteria for selecting research
- May not critique the quality of research
- Fails to outline approaches for resolving contradictory evidence
Where can you find meta-analyses and systematic reviews?
The Cochrane Collaboration

- Based on the best available information about healthcare interventions
- Cochrane Library published quarterly and available both on CD-ROM and the Internet
- Individuals and groups conduct these systematic reviews
- Guidelines are available on how to conduct a Cochrane Systematic Review
- Withdraws are issued regularly when evidence changes
- Published in multiple language translations

http://www.cochrane.org/reviews/clibintro.htm#reviews
Randomized Controlled Trials (RTCs):
Quality Criteria

- Were the setting and study patients clearly described?
- Was assignment randomized and similarity between groups documented?
- Was allocation to study groups adequately concealed from patients and investigators, including blind assessment of outcome?
- Were all clinically relevant outcomes reported?
- Were > 80% of patients who entered the study accounted for at its conclusion?
- Were participants analyzed in the groups to which they were randomized (intention to treat)?
- Were both statistical and clinical significance considered?

British Journal of Medicine:
http://clinicalevidence.bmj.com/ceweb/about/search_process.jsp
Other Levels of Evidence

- Well designed nonexperimental studies
- Observational descriptive studies
- Expert consensus
- Published case reports and clinical examples

Is a Review any Good?

The FAST Method: Questions

- Finding: Did they find most studies?
- Appraisal: Did they select good ones?
- Synthesis: What does it all mean?
- Transferability of results

Five Limitations Can Reduce the Quality of Evidence

- Study limitations
- Inconsistent results
- Indirectness of evidence
- Imprecision – Includes study instruments or ways variables are measured
- Publication bias (this can be commercial bias)
Is finding all published studies enough?

A key problem with finding all the studies is "publication bias."

**FACT:** "Negative" studies are less likely to be published than "Positive."

- How does this happen? Well, it's mostly the authors not submitting their negative studies rather than journals rejecting them.
- In a follow-up of 737 studies submitted to the ethics committee at the Johns Hopkins hospital positive studies were 2.5 times more likely to be SUBMITTED more than negative (Dickersin, JAMA, 1992)

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**EBP or Consensus Practice Guidelines**

- Typically developed by expert panels
  - Researchers
  - Clinicians
  - Methodologists/Process Facilitators
- Agreement about rating/grading system(s) to be used
- Appraised by scientific rigor and methodologies used
- Informs readers how the evidence was identified, collected, and evaluated
- Includes recommendations for practice – the obvious
- Includes an extensive review process by external experts

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**Controversial Areas for Evidence**

- What is "expert consensus?"
  - Survey of professional organization members or opinion leaders to arrive at consensus
  - Review of evidence by external experts
  - Peer review
  - Public commentary
- Who are the experts?
- Does clinical experience constitute evidence?
Evidence Rating and Grading Systems

BMJ Levels of Evidence

- GRADE System
- http://clinicevidence.bmj.com/ceweb/about/search_process.jsp

Strength of Recommendation Taxonomy (SORT):


Ratings of Levels of Evidence in a Nursing Paradigm

Oncology Nursing Society

Evidence Grading/Rating System

Category A
Meta-analyses, Systemic Reviews, RCT

Category B
Observational Cohort Studies

Category C
Equivocal Studies that cannot determine beneficial or harmful relationships

Category D
Insufficient Evidence or No studies

Opinion-Based Evidence

American Society of Anesthesiologists (ASA)

Evidence Grading/Rating System

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Meta-analyses, Systemic Reviews, RCT

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Opinion-Based Evidence

Introduction: guidelines and advisory development

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13
**ASA Evidence Grading/Rating System**

**Category A: Supportive Literature.** Randomized controlled trials report statistically significant (P < 0.01) differences between clinical interventions for a specified clinical outcome.

- **Level 1:** The literature contains multiple randomized controlled trials, and the aggregated findings are supported by meta-analysis.
- **Level 2:** The literature contains multiple randomized controlled trials, but there is an insufficient number of studies to conduct a viable meta-analysis for the purpose of this Advisory.
- **Level 3:** The literature contains a single randomized controlled trial.

**Category B: Suggestive Literature.** Information from observational studies permits inference of beneficial or harmful relationships among clinical interventions and clinical outcomes.

- **Level 1:** The literature contains observational comparisons (e.g., cohort, case–control research designs) of two or more clinical interventions or conditions and indicates statistically significant differences between clinical interventions for a specified clinical outcome.
- **Level 2:** The literature contains noncomparative observational studies with associative (e.g., relative risk, correlation) or descriptive statistics.
- **Level 3:** The literature contains case reports.

**Category C: Equivocal Literature.** The literature cannot determine whether there are beneficial or harmful relationships among clinical interventions and clinical outcomes.

- **Level 1:** Meta-analysis did not find significant differences among groups or conditions.
- **Level 2:** There is an insufficient number of studies to conduct meta-analysis and (1) randomized controlled trials have not found significant differences among groups or conditions or (2) randomized controlled trials report inconsistent findings.
- **Level 3:** Observational studies report inconsistent findings or do not permit inference of beneficial or harmful relationships.

**Category D: Insufficient Evidence from Literature.** The lack of scientific evidence in the literature is described by the following terms.

- **Silent:** No identified studies address the specified relationships among interventions and outcomes.
- **Inadequate:** The available literature cannot be used to assess relationships among clinical interventions and clinical outcomes. The literature either does not meet the criteria for content as defined in the “Focus” of the Advisory or it does not permit a clear interpretation of findings due to methodologic concerns (e.g., confounding by study design or implementation).

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**EBP or Consensus Practice Guidelines should inform readers about the process**

[Diagram of EBP or Consensus Practice Guidelines process]

National Cancer Center Network Guidelines Development Process: [Link](http://www.nccn.org/professionals/physician_gls/about.asp)
Critiquing Clinical Practice Guidelines

Guidelines make explicit recommendations and are based upon some evidence. Evaluation includes appraisal of the following items:

- The guideline specificity and population to whom it will be applicable
- All relevant options and outcomes are specified with decision-making points apparent
- Process to identify, select, and combine evidence is described and makes sense
- Includes most recent findings (e.g., is current)
- Process of peer review and evaluation specified
- Recommendations are practical and clinically relevant
- Recommendations are strong (strength of evidence described)
- Guideline responds to a clinical problem
- Recommendations are applicable to patients in your current setting
- Use of recommendations would lead to identifiable outcomes that could be measured

AGREE – Appraisal of Guidelines Research and Evaluation

- International collaboration of researchers and policy makers involving more than 10 countries
- Administered by the Health Care Evaluation Unit at St George’s Hospital Medical School in London
- Seeks to improve the quality and effectiveness of clinical practice guidelines
- Establishes a shared framework for their development, reporting and assessment of guidelines

AGREE – Appraisal Criteria

- Scope and purpose
- Stakeholder involvement
- Rigor of development
- Clarity and presentation
- Applicability
- Editorial independence (conflict of interest)

Obstacles to the Quality of Evidence for EBP

- Experts
- Industry
  - Pharmaceutical enticements
  - Pharmaceutical CME/CE
  - Pharmaceutical research
- Investigator self-interest

Evidence-Based Practice Resources

<table>
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<tr>
<th>CLINICAL PRACTICE GUIDELINES</th>
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<tbody>
<tr>
<td>Site/URL</td>
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<tr>
<td>National Guideline Clearinghouse <a href="http://www.guideline.gov">www.guideline.gov</a></td>
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<tr>
<td>National Quality Measures Clearinghouse <a href="http://www.qualitymeasures.ahrq.gov">www.qualitymeasures.ahrq.gov</a></td>
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<tr>
<td>National Comprehensive Cancer Network (NCCN) <a href="http://www.nccn.org/index.html">www.nccn.org/index.html</a></td>
</tr>
<tr>
<td>Primary Care Clinical Practice Guidelines <a href="http://medicine.ucsf.edu/resources/guidelines">http://medicine.ucsf.edu/resources/guidelines</a></td>
</tr>
<tr>
<td>Internet Stroke Center <a href="http://www.strokecenter.org/ebtc-03/index.html">www.strokecenter.org/ebtc-03/index.html</a> Available from Washington University</td>
</tr>
<tr>
<td>AGREE Collaboration <a href="http://www.agreecollaboration.org">www.agreecollaboration.org</a></td>
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GENERAL SITES WITH EXCELLENT LINKS TO OTHER EBP SITES

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<tr>
<td>Academic Center for Evidence-Based Nursing (ACE) University of Texas Health Center, San Antonio <a href="http://www.acestar.uthscsa.edu">www.acestar.uthscsa.edu</a></td>
<td>Comprehensive list of EBP Resources</td>
</tr>
<tr>
<td>Centre for Health Evidence Canadian Office of Health <a href="http://www.cche.net/chh/home/index">www.cche.net/chh/home/index</a></td>
<td>Users Guides for EBP series from JAMA. How to critique and use different types of evidence articles.</td>
</tr>
<tr>
<td>Centre for Evidence-Based Nursing, University of York <a href="http://www.york.ac.uk/healthsciences/centres/evidence/index.htm">www.york.ac.uk/healthsciences/centres/evidence/index.htm</a></td>
<td>Lists of pertinent systematic reviews and research reports</td>
</tr>
<tr>
<td>Centre for Evidence-Based Medicine (CEBM) <a href="http://www.cebm.net">www.cebm.net</a></td>
<td>How-to’s for every step in EBP process. Numerous free resources and information on flawed studies.</td>
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Evidence-Based Practice Resources

SYSTEMATIC/INTEGRATED REVIEWS

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<tr>
<td>Cochrane Library <a href="http://www.cochranelibrary.com/cochrane">www.cochranelibrary.com/cochrane</a></td>
<td>Systematic reviews and guidelines. Generally medically-oriented but considered the gold-standard of such reviews. (Can browse titles and get abstracts and Penn holds a license for obtaining these.)</td>
</tr>
<tr>
<td>Database of Abstracts of Reviews of Effects (DARE) <a href="http://www.nhscrd.york.ac.uk/welcome.htm">www.nhscrd.york.ac.uk/welcome.htm</a></td>
<td>Systematic Reviews produced and maintained by the National Health System’s Centre for Reviews and Dissemination</td>
</tr>
<tr>
<td>ONS EBP Online Resource Center Available on ONS website <a href="http://www.ons.org">www.ons.org</a></td>
<td>Late 2003 a new area on website provides a list of integrated reviews pertinent to cancer care.</td>
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<tr>
<td>Joanna Briggs Institute <a href="http://www.joannabriggs.edu.au/about/home.php">www.joannabriggs.edu.au/about/home.php</a></td>
<td>Australia-based EBP privately owned site—some free pages and some subscriptions; nursing and allied health topics</td>
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<tr>
<td>Advanced Practice Nursing <a href="http://www.enursescribe.com/advanced_practice_nursing.htm">www.enursescribe.com/advanced_practice_nursing.htm</a></td>
<td>Privately owned site with many pertinent sources.</td>
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Evidence-based Practice or Not?

- Turning patients every two hours
- Head of the bed elevated 30° to prevent VAP
- Walking up a flight a few steps before being able to tolerate sexual activity after a MI
- Sucrose as analgesic for infant pain
- Monitoring patients every hour for the first 12 hours after initiating continuous epidural infusions

Evidence Source Equation

- Scientific Evidence + Clinician Experience + Patient Preferences = EBP
- EBP process begins with the:
  - Clinical inquiry process
  - Collective expertise and reasoning among experts
  - Critical appraisal of evidence for scientific merit, strength, validity and applicability to clinical care

Can we infuse evidence into practice, or will the power of tradition prevail?

Though some scientists, particularly the older and more experienced ones, may resist indefinitely, most of them can be reached in one way or another. Conversions will occur a few at a time until, after the last holdouts have died, the whole profession will again be practicing under a single, but now different, paradigm.

Thomas Kuhn, 1962