Technology to Support an Evidence-Based Practice

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Disclosure

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Why EBP?

As a practitioner you are expected to keep up with the current changes in practice.

You are expected to be a life long self-directed adult learner.

In order to keep up with the journals relevant to your practice, we need to review 19 articles a day, 365 days of the year!

Goal is to have ninety percent of healthcare decisions be evidence-based by 2020

- IOM roundtable on EBP

Objectives:

- Briefly review Evidence-based practice principals.
- Discuss the necessary technology to support an evidence-based practice
- Discuss methods to use technology to access evidence based practice
- Application of learning

Why EBP?

EBP improves patient outcomes

Heater, Becker, & Olsen, 1988
Why EBP?

- Explicit process to enhance efficiency
- Explicit criteria for appraising evidence as valid or invalid
- Explicit strategies for incorporating evidence into clinical practice

Evidence-based Practice

- Evidence-based practice (EBP) is a problem solving approach to clinical practice that integrates the conscientious use of best evidence in combination with a clinician’s expertise as well as patient preferences and values to make decisions about the type of care that is provided. Resources must be considered in the decision-making process as well.

What tools do you need to do EBP?

- Curiosity – Curiosity – Curiosity
- Knowledge of EBP
- High Standards of Care
- Research Skills
- Informatics Skills
- Little or NO Financial Resources

Major Barriers to EBP

- Low comfort level with search techniques or with proposed guidelines.
- Perceived lack of time to search for the best evidence.
- Challenges with critically appraising research reports.
- Lack of organizational/administrative support.
- Negative attitudes toward research.
- Colleagues who are skeptical of or who do not believe in EBP.
- The difficulty in implementing new guidelines.

Technology to Support an Evidence-based Practice

- There are seven steps to an Evidence-based Practice (we will get to these shortly)
- At this point several questions arises:
  - 1. How do you access the evidence you need?
  - 2. What types of technology are available, how do you use them to your benefit, and what are some newer and unique ways of using this technology?
  - 3. How do you implement these new technologies into practice?
- These last two questions we will answer as we go through the seven steps.

The merging of Science and Art of EBP within a context of Caring Results in the Highest Quality of Patient Care
The Seven Steps of EBP

1. Cultivate a spirit of inquiry
2. Ask the burning clinical question in the format that will yield the most relevant and best evidence (PICOT format)
3. Search for and collect the most relevant and best evidence to answer the clinical question (e.g., searching for systematic reviews)
4. Critically appraise the evidence that has been collected
5. Integrate the evidence with one’s clinical expertise and the patient’s preferences and values to implement a clinical decision
6. Evaluate the outcomes of the practice decision or change based on evidence
7. Disseminate the outcomes of the EBP decision or change

The Question becomes (in PICOT):
- For health care providers who need to answer clinical questions (P), what is the best way to access evidence regarding treatments (I), to improve outcomes (O) compared with traditional knowledge methods (C)?
- Optional: (T) over what period of time?

What burning questions do you have in your clinical practice?
- In newborns (P), how does delayed cord clamping (I) compared to immediate cord clamping (C) affect neonatal iron stores (O) within first six months of life (T)?

The seven steps of EBP

Step 1: Ask the burning clinical question in PICOT format:
- Patient population
- Intervention or range of interventions of interest
- Comparison intervention or group
- Outcome of interest
- Time frame

Step 2: Collect the best evidence. Search first for systematic reviews and evidence-based clinical practice guidelines

The questions:
- How do you access the evidence you need?
- What types of technology are available, how do you use them to your benefit, and what are some newer and unique ways of using this technology?
8/3/2014

**Accessing Evidence?**

- The type of evidence that you need depends on the type of question you are answering.
- Two paths:
  - one path for quick clinical questions that you need answers (e.g., Dynamed, UptoDate)
  - one for more in-depth research type clinical questions

**Simple Resources**

- Computer
- Smart Phone
- Tablet

- High-Speed Internet Access
- Appropriate Permissions
- Appropriate Applications/Programs/Databases

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**How do you access the evidence you need?**

- Simple Answer
  - Technology-Technology-Technology

- Not so simple to do
  - Need some technological resources
  - Need some simple applications to help access the evidence

**If you have access to academic databases, select the most likely source that can help answer the question:**

- Electronic databases
  - MEDLINE
  - PsychInfo
  - CINAHL
- Database Software
  - OVID
- Web sites
  - Cochrane Library
- Pre-appraised Literature
  - http://ebn.bmjjournals.com
- Hand searching through book collections

**Applications/Programs**

- Applications/Programs for your Smart Phone/Tablet/PC/Workstations
  - http://www.essentialvideosplex.com/
  - http://www.upToDate.com/home/wkhtml/index.html
  - http://www.uptodate.com/
  - http://www.medicalapps.com/app-review/
  - http://www.lexi.com/individuals/iphone/
  - http://www.epocrates.com/

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**What types of technology are available, how do you use them to your benefit, and what are some newer and unique ways of using this technology?**
Clinical Guidelines

Group Databases

Online Databases that are housed through

But I’m not academically based - other options:

• Clinical Guidelines
• Local Libraries, Community Colleges, and State based Health Science Libraries
• Your EHR
• Online Databases that are housed through memberships with specialty organizations
• Group Databases
• Research Participation

The seven steps of EBP

3. Critically appraise the evidence
   a. Are the results valid (as close to the truth as possible)?
   b. What were the results of the study?
   c. Are the findings clinically relevant to my patient(s)?

Rating System for Levels of Evidence (Melnik & Finout-Overholt, 2011)

www.midwife.org

www.acog.org

www.npwh.org
Sources of evidence

- Reliable:
  - Use well done evidence syntheses with confidence
  - Read the pre-appraised literature (Evidence-based Nursing, Journal, ACP Journal Club)
  - Use peer-reviewed journal articles

- Less Reliable:
  - Use textbooks with caution (great source of information for background questions)

Systematic Reviews

- Where do you find them
  - Cochrane collaboration
  - Cochrane Database of Systematic Reviews (CDSR)
  - Database of Abstracts of Reviews of Effectiveness (DARE)
  - Health Technology Assessment (HTA)
  - National Library of Medicine
  - CINAHL
  - PubMed/MEDLINE

- What is a systematic review
  - Comprehensive and unbiased summary of the research on a single topic (Evans, 2000)
  - Uses the scientific approach
  - Most rigorous approach to minimize bias
  - Usually conducted by an expert or expert panel

Evidence-based Guidelines:

- Systematically developed statement to assist practitioners with patient decisions about appropriate health care for specific clinical circumstances
- Based on systematic reviews of well done evidence, clinical expertise, and expert opinion
- Includes all issues that may affect decision making

- Two major components of guidelines
  - A summary of key stakeholders in this specialty
  - Systematically developed statements to assist practitioners with patient decisions about appropriate health care for specific clinical circumstances

- Guideline: Asking Preliminary Questions
  - Does the guideline make explicit recommendations (reflecting value judgments about outcomes)?
  - Is the guideline based on all evidence — good and bad?
  - Was a comprehensive, reproducible literature review carried out in the past 24 months?
  - Were the results consistent across studies?
  - Were all the options and outcomes considered in the guideline?
  - Were the results consistent across studies?
  - Were the results consistent across studies?

Evidence-based guidelines: preliminary questions, cont.

- Foundational Knowledge for the Critical Appraisal of Intervention Studies

- The independent variable (the treatment or intervention) must precede the dependent variable or outcome in time
- There must be a relationship between the IV & the DV
- This relationship can not be explained by the other extraneous factors
Explanations for differences between study groups in intervention studies

- Extraneous/confounding variables
- Differences between how the groups were treated during the clinical trial
- The treatment or intervention worked

Critical appraisal of a therapy or intervention trial

- Are the results valid?

- Five major questions
  - Were subjects randomly assigned to the tx groups and was the random assignment concealed from the individuals involving subjects?
  - Were patients and providers kept blind to treatment?
  - Was the follow-up sufficiently long to study the effects of the treatment and were all patients accounted for at the end of the study?
  - Were patients analyzed in the group to which they were assigned?
  - Were the groups treated equally aside from the experimental treatment?
  - Was the control group appropriate?
  - Were the instruments used to measure the outcome variables valid and reliable?

Critical appraisal of a therapy or intervention trial

- How precise were the treatment effect?

- P value
  - The probability of an event given the assumption that there is no true difference between the intervention and control
  - Unlike CI’s, p values do not tell us anything about the precision of the measures or the size of the effect

- Confidence Intervals
  - The range in which the real answer lies with a given degree of certainty (usually 95%)
  - Describe an interval around the estimated effect point (you can get results within this interval, if you replicate their intervention)

Critical appraisal of a therapy or intervention trial

- What are the results of the study and are they important?

- Statistical significance vs. clinical meaningfulness
  - Statistical significance: the results obtained in a study are unlikely to be caused by chance
    - Is largely dependent upon the power and number of subjects in a study
    - The larger the sample, the greater the power and probability of detecting significant differences between study groups even when effect sizes are small (fictitious example)
  - When evaluating intervention trials, the focus should be on the magnitude of effects instead of statistically significant differences

- Relative Risk Reduction (RRR): proportion of risk for bad outcomes in the intervention group compared to the unexposed control group. This is a problem when we only look at the p-value. It is dependent on sample size, need to look at effect size as well.

- Absolute Risk Reduction (ARR): the absolute difference between the unexposed and exposed groups’ risks (ie. Occurrence in the unexposed/control group subtracted from the occurrence in the exposed intervention group)

- Number needed to treat (NNT): the number of patient the need to be treated to achieve one additional favorable outcome.

- Number needed to Harm (NNH): the number of patients that need to be treated to achieve one negative outcome.

- Effect Size: an estimate of how large the treatment effect is, that is how well the intervention worked in the experimental group in comparison to the control group.

Statistics aside

- Risk Ratio [relative risk – RR]
  - Reported as measures of association between groups exposed and unexposed to the intervention and the outcome
  - Measures the strength of association
  - If the outcome is something we want or positive (ie. BF) RR > 1 means the treatment is better than control
  - If the outcome is something we do not want or negative (ie death), RR < 1 means the treatment is worse than control

- Odds Ratio (OR)
  - The odds of a case patient (ie. Someone in the intervention group) being exposed divided by the odds of a control patient being exposed
  - Usually reported in retrospective studies such as case control studies where the number of sick and not sick patients is known but not the total number of people
  - If the outcome is something we want or positive (ie BF), OR > 1 means the treatment is better than the control
  - If the outcome is something we don’t want or negative (ie. Death), OR < 1 means the treatment is worse than control
Websites to help with Step 3: Critical appraisal

- http://www.clahrc-nihr.ac.uk/evidence/appraising-evidence
- http://guides.lib.unc.edu/content.php?pid=18297
- http://iskillzone.uwe.ac.uk/RenderPages/Render Constellation.aspx?Context=10&Area=8&Room=46&Constellation=34

The seven steps of EBP

4. Integrate evidence, clinical expertise, and patient factors preferences to implement a decision

5. Evaluate the outcome

   1. Will the results from this study help me in caring for my patients?
   2. Were all clinical important outcomes considered?
   3. What are the risks and benefits of the treatment?
   4. Is the treatment feasible in my clinical setting?
   5. What are my patient’s values and expectations for both the outcome that is trying to be prevented and the treatment itself?

Why Measure EBP Outcomes?

- Outcomes reflect IMPACT!
- EBP’s effect on patients:
  - Physiologic (complication reduction, health improvement)
  - Psychosocial (quality of life; depressive and anxiety symptoms; patient perception of care)
  - Functional improvement
- EBP’s effect on the health System:
  - Decreased cost, length of stay;
  - Nursing retention / job satisfaction
  - Interdisciplinary collaboration

Implementation

- How do you implement an evidence-based practice?
- How do you help colleagues implement an evidence-based practice?
- Why is this important?
- How do you overcome barriers to EBP?
- Can you give an example of an evidence-based practice change in your clinical practice?
Centers for Evidence-based Practice

- [http://www.centerforebp.case.edu/](http://www.centerforebp.case.edu/)
- [http://www.cebm.net/](http://www.cebm.net/)
- [https://www.ecri.org/about/pages/evidencebasedpracticecenter.aspx](https://www.ecri.org/about/pages/evidencebasedpracticecenter.aspx)

Let’s Practice

- Develop a PICOT question
- Find Some Evidence
- Appraise your Evidence
- Decide whether you should change a practice
- Implement the change

Step 6: Disseminate the outcomes of the EBP decision or change

- Remember the story of Semmelweis and his quest to encourage handwashing to prevent puerperal fever!

Questions?

Develop a PICOT question:

- **Intervention**
  - In ___(P), how does ___(I) compared to ___(C) affect ___(O) within ___(T)?

- **Prognosis/Prediction**
  - In ___(P), how does ___(I) compared to ___(C) influence/predict ___(O) over ___(T)?

- **Diagnosis or Diagnostic Test**
  - In ___(P), are ___(I) compared with ___(C) more accurate in diagnosing ___(O)?

- **Etiology**
  - Are ___(P) who have ___(I) compared with those without ___(I) at risk for/less (O) over ___(T)?

- **Meaning**
  - How do ___(P) with ___(I) perceive ___(O) during ___(T)?