EBP Literature Searching Skills - Part 1

8th Annual Nursing Research Conference
Christiana Hospital, Newark, DE
November 1, 2013

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Agenda – Part 1

- Path to an evidence-based practice
- Formulating a research question
- Using the PICO format
- Type of clinical questions
- Study types
- Simple search and database record review
- Practice clinical query and search strategy development
- Tips for creating a search strategy
The Desire

- Consistently deliver high quality healthcare
- Achieve the best patient outcomes
- Maintain a professional commitment to an evidence-based practice
The Challenge

- Two million articles published in the biomedical literature annually (year: 1978)\(^1\)

- Publication growth rate is increasing geometrically

- If practitioners were to attempt to keep up with the literature by reading two articles per day, in 1 year they would fall 55 centuries behind\(^1\)

- If physicians were to read everything of possible biomedical relevance, they would need to read 5500 articles per day (year: 1986)\(^2\)

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\(^1\) Cogent Communication: Overcoming Information Overload. Bernier, & Yerkey 1979

\(^2\) How to keep up with the medical literature: I. Why try to keep up and how to get started. Annals of Internal Medicine, 1986
What is needed?

- First requirement: a spirit of inquiry

- Second requirement: critical thinking
  - Be aware (beware) of assumptions (pervasive in our thinking patterns)
    - Cloud our thinking
    - Check their accuracy and validity
  - Begin reasoning toward inferences (thoughts we form as we reason toward conclusions)
  - Find evidence to support our inferences
  - Draw conclusions from developed observations & facts

1 Adapted from Evidence-based practice, step by step: Asking the clinical question: A key step in evidence-based practice, American Journal of Nursing, 2010
2 Adapted from Teaching Evidence-Based Practice in Nursing, Levin & Feldman 2013
What is needed?

- Third requirement: asking the clinical question
  - Well-built clinical questions help us search for the most current literature
  - Use PICO(T) as a guide to systematically identify components of a clinical issue
    - Increases likelihood of quickly and efficiently finding the best evidence to inform your practice

Adapted from Evidence-based practice, step by step: Asking the clinical question: A key step in evidence-based practice, American Journal of Nursing, 2010
What is needed?

- Fourth requirement: tenacity when doing library research
  - Searching is a complex process
  - Give yourself time to get to know a tool
    - Basic online tutorials
    - Trial and error
    - Ask your librarian
Begin to formulate question

❖ Is it a Background question?
  o General information on an issue
  o Answer can usually be found in a textbook
  o Necessary before you can answer a foreground question
    ▪ e.g. What is eczema?

❖ Is it a Foreground question?
  o Focus on a specific clinical issue
  o Can be answered from scientific literature
    ▪ e.g. Will acupressure help my patient with eczema?
PICO (T)

P  (population, patient, or problem)
I  (intervention)
C  (comparison)*
O  (outcome)
(T) (time)*

*not always required
PICO*

- **P** (age, gender, specific disease)
- **I** (therapy or issue of interest)
- **C** (alternative treatment, placebo, no intervention)
- **O** (expected outcome (positive) or outcome to avoid)

*Your query may not always fit neatly into the PICO format*
Types of clinical questions

- Intervention/Therapy
- Diagnosis (or diagnostic test)
- Prognosis
- Etiology/Harm
- Meaning
Intervention/Therapy

- In ________________________________ (P)
- How does___________________________ (I)
- Compared to ________________________ (C)
- Affect ______________________________ (O)
- Within _____________________________ (T)

Evidence-Based Practice in Nursing and Healthcare. Melnyk & Fineout-Overholt 2011
Diagnosis

- In ______________________________ (P)
- Are/is ___________________________ (I)
- Compared with ____________________ (C)
- More accurate in diagnosing __________ (O)

Evidence-Based Practice in Nursing and Healthcare. Melnyk & Fineout-Overholt 2011
Prognosis

- In ________________________________ (P)
- How does ________________________________ (I)
- Compared to ________________________________ (C)
- Influence or predict ________________________________ (O)
- Over ________________________________ (T)

Evidence-Based Practice in Nursing and Healthcare. Melnyk & Fineout-Overholt 2011
Etiology

- Are _________________________________ (P)
- Who have __________________________ (I)
- Compared with those without _________ (C)
- At _________ risk for ________________________ (O)
- Over _________________________________ (T)

Evidence-Based Practice in Nursing and Healthcare. Melnyk & Fineout-Overholt 2011
EBM Levels of Evidence Pyramid
Let’s try a simple search first

Field searching (free-text)

You heard about an article that has chocolate and happiness in the title but you have no other details about it

• Concept 1: chocolate AND Concept 2: happiness
• Search in Medline
Result:

A clinical trial gone awry: the Chocolate Happiness Undergoing More Pleasantness (CHUMP) study.

Let’s take a look at the record

MeSH Subject Headings

Adult
*Cacao* (this is the preferred term for chocolate; the asterisk means that it is a major focus of the article)
*Candy*
Double-Blind Method
Feeding Behavior
Female
*Happiness*
Humans
Male
*Wit and Humor as Topic* (clicking on any hyperlinked subject heading will take you to articles in the database that are indexed with it; this heading has 2,829 papers that are indexed in Medline, that is, out of over 22 million biomedical articles in Medline, only 2,829 are humorous 😊)
Before we go any further…

Let’s talk about the process of creating a search strategy along with some search tips
Create a search strategy

- Select a database(s) (e.g. Medline, CINAHL)

- Use keywords (main concepts) from your PICO question to formulate your search strategy
  - It helps to put them in the format of a chart
    - Columns for each main concept (these concepts will be combined in the strategy using ‘AND’) but first…
    - Add additional similar or related terms for each main concept (these similar terms can be searched together using ‘OR’ in the strategy)
Create a search strategy

- Use database’s controlled vocabulary to find the preferred subject headings for that database that closely match the terms in your chart
  - “MeSH” (Medline) - Medical Subject Headings
  - “CINAHL Headings”

- Use free-text (e.g. as you would enter terms in a Google search box) when your term is not indexed in the database’s controlled vocabulary
  - newer terms or concepts often don’t make it into the database’s controlled vocabulary right away
Searching tips

- Major focus: your term must be the main point of the article

- Truncation: use asterisk in many databases to obtain various forms of a term (useful if term is not in database’s controlled vocabulary)
  - E.g. impermeab* will retrieve articles that contain impermeable or impermeability
Searching tips

❖ Explode function: database will search for related terms under a subject heading

❖ Boolean searching: AND, OR, NOT

❖ Combining search statements
  o E.g. CINAHL: S1 AND S2 (tick box next to set 1 and set 2 then click on ‘Search with AND’ button to combine them)
More searching tips

❖ Limits & Filters: date, language, review articles, systematic reviews, clinical queries, etc.

❖ Utilize subheadings in MeSH and CINAHL: help to refine your topic. E.g. heart failure/therapy
  ▪ The subheading/therapy signifies therapy (in both Medline and CINAHL) and by adding it to your term ‘heart failure’ it will retrieve records with the focus of heart failure and therapy)

❖ Related citations

❖ Utilize database tutorials
Clinical Scenario

A nurse in a pain clinic works with patients with chronic back pain and wonders if evidence supports the use of yoga as a treatment option.

Create PICO Question

What type of question is it?

Intervention/Therapy or Etiology or Diagnosis?

In ____”patients with chronic back pain” __________________________ (P)
How does ___”yoga” ____________________________ (I)
Compared to _____________________________ (C)
Affect ____ ”pain management” ____________________________ (O)

“Do patients with chronic back pain who practice yoga experience less pain?”
<table>
<thead>
<tr>
<th>Concept 1</th>
<th>AND</th>
<th>Concept 2</th>
<th>AND</th>
<th>Concept 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic back pain</td>
<td></td>
<td>Yoga/</td>
<td></td>
<td></td>
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<tr>
<td>(use preferred MeSH term: Back Pain/)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use subheadings for ‘therapy’ and ‘prevention and control’ – Back Pain/th, pc</td>
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<tr>
<td>OR</td>
<td></td>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Back Pain/th, pc</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
<td></td>
<td>Pain measurement/</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td>Quality of Life/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td>Treatment Outcomes/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Suggested Search Strategy* in OVID Medline

1. exp Low Back Pain/th, pc
2. exp Back Pain/th, pc
3. 1 or 2
4. exp Yoga/
5. 3 and 4
6. limit 5 to (english language and clinical trial, all)

*One size does not fit all! Search strategies will vary for each research question.
Suggested Search Strategy* in CINAHL

1. (MH "Back Pain+/PC/TH") OR (MH "Low Back Pain/PC/TH")
2. (MH "Yoga+")
3. S1 AND S2
4. Apply Limiters - English Language; Research Article

*One size does not fit all! Search strategies will vary for each research question.
EBP Literature Searching Skills - Part 2

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Agenda – Part 2

❖ Study types (continued)

❖ Practice clinical query and search strategy development
  o using your own clinical scenario or one from the instructor

❖ Professional practice
Study types

Can be found in biomedical literature databases

- Systematic Reviews
- Meta-analysis
- Randomized controlled clinical trials
- Cohort studies
- Case control studies
- Case series and Case reports
- Cross-sectional studies

See description of studies at:
http://guides.mclibrary.duke.edu/content.php?pid=431451&sid=3530453
EBM Levels of Evidence Pyramid
EBM Levels of Evidence Pyramid

- **Meta-analysis**
- **Systematic Reviews**
- **Randomized Controlled Trials**
- **Cohort Studies**
- **Case Control Studies**
- **Case Series & Case Reports**
- **Animal Studies / Laboratory Studies**

**RCTs and controlled clinical trials** help to answer treatment questions and diagnosis questions. If there aren’t any RCTs or controlled clinical trials, move down the pyramid to the next best option.

Cohort Studies help to answer **prognosis questions and etiology/harm questions.**

When you cannot find a cohort study to answer your prognosis or etiology/harm question, look for a Case Control Study.

When you cannot find a cohort study or a case control study to answer your prognosis or etiology/harm question, look for a Case Series or Case Report.

Source: http://researchguides.dml.georgetown.edu/content.php?pid=129563&sid=1111394
<table>
<thead>
<tr>
<th>Type of Question</th>
<th>Suggested best type of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy</td>
<td>RCT &gt; cohort &gt; case control &gt; case series</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>prospective, blind comparison to a gold standard</td>
</tr>
<tr>
<td>Etiology/Harm</td>
<td>RCT &gt; cohort &gt; case control &gt; case series</td>
</tr>
<tr>
<td>Prognosis</td>
<td>cohort study &gt; case control &gt; case series</td>
</tr>
<tr>
<td>Prevention</td>
<td>RCT &gt; cohort study &gt; case control &gt; case series</td>
</tr>
<tr>
<td>Clinical Exam</td>
<td>prospective, blind comparison to gold standard</td>
</tr>
<tr>
<td>Cost</td>
<td>economic analysis</td>
</tr>
</tbody>
</table>

Source:
http://www.hsl.unc.edu/Services/Tutorials/EBM/Supplements/QuestionSupplement.htm
Cochrane Database of Systematic Reviews

- Systematic reviews of research in healthcare and health policy
- Type of reviews include
  - Intervention
  - Diagnostic
  - Methodology
- Findings based on the results of trials which meet certain quality criteria
- Can search for reviews in Medline but must subscribe to Cochrane to view full reviews
A Protocol is an outline of a review in preparation.
Clinical Scenario

A nurse working with asthmatic patients in a hospital setting is occasionally asked by patients being discharged if they should use impermeable bed covers to decrease exposure to dust mites.

Create PICO Question

What type of question is it?

Intervention/Therapy or Etiology or Diagnosis?

In ______”asthmatic patients”__________________ (P)
How does _”the use of impermeable bed covers”____ (I)
Compared to _________________________________ (C)
Affect ______”peak expiratory flow”___________________ (O)

In patients with asthma does the use of impermeable bed covers improve peak expiratory flow?
### Medline

<table>
<thead>
<tr>
<th>Concept 1</th>
<th>AND</th>
<th>Concept 2</th>
<th>AND</th>
<th>Concept 3</th>
<th>AND</th>
<th>Concept 4</th>
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</thead>
<tbody>
<tr>
<td>Asthma/</td>
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<td>Bedding</td>
<td></td>
<td>Impermeable</td>
<td></td>
<td>peak expiratory flow</td>
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<td></td>
<td>(use preferred MeSH term: Bedding and Linens/)</td>
<td></td>
<td>(not a preferred term; use impermeab* to retrieve impermeable and impermeability)</td>
<td></td>
<td>(use preferred MeSH term: peak expiratory flow rate/)</td>
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<td>OR</td>
<td></td>
<td>OR</td>
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<td>OR</td>
<td></td>
<td>To broaden your topic you may consider other terms to ‘OR’ with “peak expiratory flow”, e.g. “symptoms”</td>
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<tr>
<td>Linens</td>
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<td>Barier</td>
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<td>(use preferred MeSH term: Bedding and Linens/)</td>
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<td>(not a preferred term; use barrier* to retrieve barrier or barriers)</td>
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</table>

*MeSH* stands for *Medical Subject Headings*. This is a controlled vocabulary used by the National Library of Medicine for indexing articles in PubMed.
Suggested Search Strategy* in OVID Medline

1. exp Asthma/
2. exp "Bedding and Linens"/
3. cover*.mp.
4. 2 or 3
5. impermeab*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]
6. barrier*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]
7. 5 or 6
8. exp Peak Expiratory Flow Rate/
9. 1 and 4 and 7 and 8
10. limit 9 to (english language and clinical trial, all)

*One size does not fit all! Search strategies will vary for each research question.
Your legacy!

- Commitment to a professional practice
- Career vs job
- Share your knowledge beyond your institution
- **Publish your results**
  - NAHRS 2012 Selected List of Nursing Journals
    [http://nahrs.mlanet.org/home/](http://nahrs.mlanet.org/home/)
Resources

- AGREE II (international tool for the assessment of practice guidelines) [http://www.agreetrust.org/](http://www.agreetrust.org/)
- CINAHL (Cumulative Index for Nursing and Allied Health Literature); subscription-based via EBSCOHost; check your library resources
- Cochrane Database (for systematic reviews); subscription-based; can retrieve titles/abstracts from Medline but full records only through subscription (check your library resources)
- DARE (Database of Abstracts of Review of Effects); a database of abstracts of quality assessed systematic reviews produced by the Centre for Reviews and Dissemination; available at [http://www.crd.york.ac.uk/crdweb/](http://www.crd.york.ac.uk/crdweb/) and its content is also available via the Cochrane Library, TRIP Database, OVID’s Evidence-Based Medicine Reviews.
- InterTASC Information Specialists' Sub-Group Search Filter Resource (search filters designed to retrieve research by study design or focus) [https://sites.google.com/a/york.ac.uk/issg-search-filters-resource/home](https://sites.google.com/a/york.ac.uk/issg-search-filters-resource/home)
- Joanna Briggs Institute EBP Database (includes systematic reviews); subscription based [http://joannabriggs.org/](http://joannabriggs.org/) (check your library resources)
Resources

• KT Clearinghouse (formulating answerable clinical questions)  
  http://ktclearinghouse.ca/cebm/practise/formulate

• Medical Library Association: Nursing and Allied Health Resources 
  Section: NAHRS 2012 Selected List of Nursing Journals  
  http://nahrs.mlanet.org/home/

• Medline (biomedical literature database); free access at PubMed  
  www.pubmed.gov/ but full-text might not be freely available; or via OvidSP (subscription-based), check your library resources

• National Guideline Clearinghouse (public resource for evidence-based clinical practice guidelines)  
  http://www.guideline.gov/

• Natural Standard (evidence-based information about complementary and alternative medicine); subscription based  
  http://www.naturalstandard.com/ (check your library resources)

• PubMed Health (clinical effectiveness research)  

• Trip Database (searches multiple sources for evidence-based information); free access at  
  http://www.tripdatabase.com/
References


Thank you!

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Link to slides http://jdc.jefferson.edu/aisrpubs/33/