INFORMATION SEARCH SKILLS IN SUPPORT OF EVIDENCE BASED PRACTICE

“...the integration of best research evidence with clinical experience and patient values.” Sackett et al, 2000

The practice of evidence-based practice/medicine (EBP/M) is typically based on seven steps: formulating a clear and answerable question; finding the best evidence; critically evaluating the evidence; applying the knowledge gained to your practice; and evaluating the results or performance. This guide shows you how to complete the first two steps: formulating a clear and answerable question and how to search databases for the evidence.

A) Formulating the Question and Creating an Evidence-Based Search

Before you begin, are there any background questions that need to be answered. A background question is a general question that answer basic knowledge needs, i.e. do you need to find general information about fibromyalgia before you start searching for therapies on fibromyalgia.

1. Background Question Resources:

   - Textbooks, both electronic and paper, this includes handbooks, dictionaries, encyclopedias, etc. – use the library catalogue
   - Health related websites such as: Medline Plus and the Canada Health Network

2. From your case or scenario, create a well-defined question.

To successfully search for best-evidence information you need to change your case or scenario into a question. The following example shows how to create a question from a typical scenario.

Example: You are working on getting post-stroke patients towards a high level of daily activity. Prior to setting up a program you need to do an assessment of the patient, however you are not sure which assessment you should use and decide you want to search the literature for recommended measures.

Question: Among patients who have suffered a stroke, what assessment tools provide the best measure for determining their level of daily activity?

3. Use the PICO model to help you identify and formulate your question. The PICO model is used to identify the necessary concepts or parts that makeup an answerable question.

   Patient, population or problem – includes disease state
   Intervention – the treatment being considered
   Comparison – are you comparing the intervention to a control (there is not always a comparison)
   Outcome – specific outcome you are interested in (this can be implied, therefore sometimes there is no need to search an outcome)

   Using the example above:
4. **Identify the domain for your question.** In EBP/M, domain plays a very important role because it determines the filters you need to apply to your search to pull out the articles that contain the best evidence. There are four primary domains in EBP/M:

- Therapy – measuring the effectiveness of a treatment or intervention
- Diagnosis – measuring the validity and reliability of a test
- Prognosis – determining the outcome of a disease
- Etiology (Harm) – assessing a substance’s relation to the development of a disease or illness

*For our example the domain is therapy and we would use either the broad or narrow search depending on our needs and or results.*

Select the design types and keywords associated with each domain and apply them to your search. Certain study designs and keywords are associated with each domain. When these design types and/or keywords are applied to a search they can extract best-evidence information from the larger pool of knowledge. Searches can be optimized for breadth, the retrieval of as many EBP/M documents as possible (often contains some non-relevant documents); or for narrowness, the retrieval of the most relevant articles (you may miss some “fringe” EBP/M articles using this search). The following list gives the design types and keywords that can be used to search each domain.

**Therapy**

Broad Search Strategy
“randomized controlled trial” OR “clinical trial” OR “drug therapy” OR “therapeutic use”
OR random* (* indicates wildcard)

Narrow Search Strategy
(double AND blind*) OR placebo*

**Diagnosis**

Broad Search Strategy
“sensitivity and specificity” OR diagnosis OR “diagnostic use” OR (predictive AND value*)
OR reliability OR validity

Narrow Search Strategy
“sensitivity and specificity” [as a MeSH or subject heading] OR (predictive AND value*)

**Prognosis**
Broad Search Strategy
incidence OR mortality OR “follow-up studies” OR prognos* OR predict* OR course

Narrow Search Strategy
prognosis [as a MeSH or subject heading] OR “survival analysis”

Etiology/Harm

Broad Search Strategy
“cohort studies” OR risk OR (odds AND ratio*) OR (relative AND risk*) OR (case AND control*)

Narrow Search Strategy

“case-control studies” [as a MeSH or subject heading] AND “cohort studies” [as a MeSH or subject heading]

Qualitative Studies

ethnography OR phenomenology OR grounded theory OR focus group OR narratology OR qualitative research OR “case study” OR participatory action research

For our example the search filters for diagnosis would be use: “sensitivity and specificity” OR diagnosis OR “diagnostic use” OR (predictive AND value*) OR reliability OR validity).

5. Select the Appropriate Database to Answer Your Foreground Question. The following list represents the most common databases used to find EBP/M articles:

• PubMed
• CINAHL
• EMBASE
• SCOPUS

6. Use a Search Map to Plan Your Search Strategy. Worksheets help you organize your search and remember words, phrases, and subject headings when you search the next database.

Question: Among patients who have suffered a stroke, what assessment tools provide the best measure for determining their level of daily activity?
<table>
<thead>
<tr>
<th>Concept 1 / Patient/Problem</th>
<th>Concept 2 / Intervention</th>
<th>Concept 3 / Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-stroke OR Post Cerebral Vascular Accident</td>
<td>Assessment OR outcome* OR measure* OR scale, etc.</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concept 4 / Outcome</th>
<th>Domain Filters</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>(not searched)</td>
<td>“sensitivity and specificity” OR diagnosis OR “diagnostic use” OR (predictive AND value*) OR reliability OR validity</td>
<td>English</td>
</tr>
</tbody>
</table>

7. **Run your search – assess – adjust – run your search again.** Searches are seldom successful on the first go-around, and often need to be adjusted and re-run. Be prepared to adjust your search depending on how satisfied you are with results of your search.

B. EBP/M Information

1. **Boolean Operators.** Boolean operators are used to combine search statements within databases. There are several different operators, but the two most important are AND and OR.

   - **OR** – used to bring like concepts together, use this to build or expand a single concept
   - **AND** – used to bring different concepts together, use this to narrow your search by adding one concept to another

2. **Publication Types** (definitions from the PubMed database).

   **Review Articles:** An article or book published after examination of published material on a subject. It may be comprehensive to various degrees and the time range of material scrutinized may be broad or narrow, but the reviews most often desired are reviews of the current literature.

   **Clinical Trial:** Work that is the report of a pre-planned clinical study of the safety, efficacy, or optimum dosage schedule of one or more diagnostic, therapeutic, or prophylactic drugs, devices, or techniques in humans selected according to predetermined criteria of eligibility and observed for predefined evidence of favorable and unfavorable effects.

   **Randomized Clinical Trial:** Work consisting of a clinical trial that involves at least one test treatment and one control treatment, concurrent enrollment and follow-up of the test- and control-treated groups, and in which the treatments to be administered are selected by a random process, such as the use of a random-numbers table.
**Meta-Analysis:** Works consisting of studies using a quantitative method of combining the results of independent studies (usually drawn from the published literature) and synthesizing summaries and conclusions which may be used to evaluate therapeutic effectiveness, plan new studies, etc. It is often an overview of clinical trials.

**Systematic Review:** A form of structured literature review that addresses a question that is formulated to be answered by analysis of evidence, and involves objective means of searching the literature, applying predetermined inclusion and exclusion criteria to this literature, critically appraising the relevant literature, and extraction and synthesis of data from evidence base to formulate findings.

**Cohort Studies:** Studies in which subsets of a defined population are identified. These groups may or may not be exposed to factors hypothesized to influence the probability of the occurrence of a particular disease or other outcome. Cohorts are defined populations which, as a whole, are followed in an attempt to determine distinguishing subgroup characteristics.

**Case Control Studies:** Studies which start with the identification of persons with a disease of interest and a control (comparison, referent) group without the disease. The relationship of an attribute to the disease is examined by comparing diseased and non-diseased persons with regard to the frequency or levels of the attribute in each group.

**Case Series Studies:** Describe the process of patient/client management, examination, evaluation, diagnosis, prognosis, intervention – and the outcomes for a single patient or a group of patients.