Evidence Based Practice (EBP)

EBP is a process that involves finding the most current evidence based literature (usually a Randomized Controlled Trial), using your clinical expertise, and combining it with the needs of your patient(s) to make a treatment or diagnostic decisions, or to change policies.

EBP is usually a specific question about diagnostic tests, therapy, prognosis, harm/etiology, prevention, cost analysis or qualitative studies.

The Steps in the EBP Process

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
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<td>1.</td>
<td>Start with the patient -- a clinical problem or question arises from the care of the patient</td>
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<td>2.</td>
<td>Construct a well built clinical question derived from the case</td>
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<td>3.</td>
<td>Select the appropriate resource(s) and conduct a search</td>
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<td>4.</td>
<td>Appraise that evidence for its validity (closeness to the truth) and applicability (usefulness in clinical practice)</td>
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<td>5.</td>
<td>Return to the patient -- integrate that evidence with clinical expertise, patient preferences and apply it to practice</td>
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<td>6.</td>
<td>Evaluate your performance with this patient</td>
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Let's walk through the first three steps

Step 1. Identify the patient(s) or the problem from this Scenario:
A disgruntled patient complained to you that her OB/GYN provider answered a phone call during her exam and did not change her gloves after using the cell phone. You also observe a similar behavior in your practice and wonder if cellphones, like stethoscopes, can transmit infections to patients (or to others). If so, should clinicians be educated in proper infection control measures when using cellphones during patient care? Since cellphones are ubiquitous, should everyone visiting or working in a clinical area or hospital be made aware of these issues?

Step 2. Frame your clinical RESEARCH QUESTION or statement using PICO(TT), PICO, or PEO
PICO(TT) is an acronym to help you formulate your specific patient question

Patient or Problem or Population—describe the population or problem
Intervention—describe the intervention/treatment, diagnostic study, or drug interventions
Comparison (optional)—(i.e. CT scan vs. MRI, or oral dose vs. IV, statins or no statins)
Outcome—describe what you want to accomplish, to measure, to improve, or to affect
Time element to evaluate results (optional), or the Type of Question / Type of Study that is required for your PICO question
Why use PICO?
- Helps you form a focused question
- Assists you in brainstorming keywords for your research

When do you use PICO?
- When you are looking for evidence to support best practice
- Patient centered outcome measures (e.g. pressure ulcers, falls, VAP)
- Nurse Centered Intervention Measures (e.g. smoking cessation counseling)
- System Centered Measures (e.g. Ventilator/Sepsis bundles developed by the Institute for Healthcare Improvement or IHI and are evidence based and have shown to improve patient outcomes.)
- When you have a question about patient care

For qualitative research or for exposure outcomes, PEO (Population, Exposure, and Outcomes) is recommended.

Example: Are high school students that are exposed to bullying develop depression?

What are the most important concepts or key concepts in your question?

Population: clinicians using cellphones in the clinical area

Intervention: proper infection control measures before and after cellphone use (hand hygiene and device decontamination)

Comparison: no infection control measures

Outcome: decreased transmission of bacterial infections

Your PICO Question(s) might be:

Do cell phones harbor infections that could contribute to hospital associated infections? Does following infection control guidelines before and after using cell phones among healthcare workers reduce hospital acquired infections? What is the role of cell phones in spreading nosocomial infections?


BRAINSTORM Keywords or Key phrases

Keywords are the main ideas of your research question. Keywords are the exact words used by the author in the title or the abstract and may or may not be the focus of the article. Discover more terms by reading articles that you find!! Look at the bibliography in each article to make sure you have the titles. Databases only search for the words you type.
Example:

**Cellphones:** mobile phone* OR smart phone* OR smartphone* OR tablet* OR cell phone* OR cellphone* OR cellular phone* OR hand-held* OR iPad* OR handheld device* OR droid* OR mobile device* OR keypad* OR touch-screen OR iPhone*

**Clinicians:** healthcare worker* OR health personnel OR physician* OR clinician* OR nursing student* OR nurse* OR surgeon* OR APRN

**Infection:** infection* OR contaminat* OR pathogen* OR nosocomial OR hospital acquired OR communicable diseases OR equipment contamination OR cross infection OR fomites OR fungi OR contamination  [Fomites is also a MeSH term meaning inanimate objects that carry pathogenic microorganisms and thus can serve as the source of infection. Microorganisms typically survive on fomites for minutes or hours. Common fomites include clothing, tissue paper, hairbrushes, and cooking and eating utensils].

**Infection control:** Disinfectants OR disinfection OR infection control OR hand washing OR handwashing OR hand hygiene OR alcohol swipes OR sanitization

**BRAINSTORM Subject Headings**

Most articles are indexed by subject experts who read the articles and assign a specific terminology to describe the **content** of the article.

In PubMed the subject headings are called **Medical Subject Headings** or **MeSH**. When you use MeSH terms you retrieve all records on a subject regardless of the terms used by the author. This is also true with the **CINAHL Subject Headings**.

To view **MeSH** terms for a particular citation, click the title and scroll below the abstract and click.

Some articles may be without MeSH terms for various reasons (e.g. in process of being indexed, out of MEDLINE scope, or just released by the publisher) so you will need to use keywords.

To find **MeSH** terms for your search, change drop down menu next to search box from PubMed to MeSH.

**Combine the BEST keywords and subject headings in your search for comprehensiveness**

**Example of keywords, MeSH, and a combination of both:**

(Contamination OR cross infection) AND (smartphone* OR cell phone* OR cellphone* OR cellular phone* OR droid*)

"Cell Phone"[Mesh] AND ("Cross Infection"[MeSH] OR “Equipment Contamination”[Mesh])

("Cell Phone"[Mesh] OR smartphone* OR mobile phones) AND ("Cross Infection"[Mesh] OR "Fomites"[MeSH] OR fomites)
Select the BEST Search Tools!

Databases

Click Research Databases from lib.uconn.edu and select one database at a time.

If PDF link is not available, click UCONN Full Text to link through to the item or to request item via Interlibrary Services.

Examples of pertinent databases for this project are on the EBSCO platform:

- CINAHL Plus with Full Text (Cumulative index to Nursing and Allied Health)
- Academic Search Premier
- PsycINFO

Examples of other helpful databases that are not in EBSCO, but available through the library:

- PubMed (including Medline)
- Scopus
- Cochrane (Systematic reviews and clinical trials; login is not necessary)
- TRIP Medical Database (free search engine) Turning Research Into Practice

NOTE: When you find an article of interest, copy/paste the article title in Scopus to find other articles that have cited this article. In this example, the 2013 citation by Manning was cited in 28 publications. Each publication may have unique search terms. View the bibliography from each article.

Full-text Databases

Is a searchable collection of research literature that includes the entire text of an article or book, reproduced as a webpage and/or in PDF format, and other related resources.

These databases may be multidisciplinary (covering a range of subjects) or subject-specific (for one subject only), and are limited in scope!

Example: PMC (PubMed Central), JSTOR
Reliable health related web sites

Useful for background information, statistics and guidelines.

**Example:** DynaMed Plus (an EB tool), Micromedex Healthcare Series, MedlinePlus, Medscape Reference, AccessMedicine (for clinical sources, e.g. Current Practice Guidelines in Primary Care 2019)

**Examples from U.S. health agencies:** AHRQ, Patient Safety Network, U.S. Preventive Services Task Force Recommendations (USPSTF), ERCI Institute (replaces the National Guidelines Clearinghouse), CDC FastStats, CDC Features, CDC, Healthy People, National Institute of Nursing Research

Search box on Library webpage

Searches multiple databases and the library’s catalog at once. The library catalog is an online tool used to find items housed physically in the library and electronic items such as articles, eBooks and streaming media. Remember to SIGN IN to renew what you have checked out, to create and save lists, or to request items. WorldCat is another tool that searches our holdings and other research libraries.

You can find a lot of research on a topic quickly, but it may bring back too many results from many different fields of study on a topic.

Certain databases (e.g., CINAHL, PsycINFO, or Academic Search Premier) may not be included, so it is still important to check the other databases!

**Advanced Search** screen is more efficient and much easier to narrow results.

Browse journals for information (not always efficient)!

Click Find on webpage; then click E-Journal Search; type the name of the journal. You can Browse the Table of Contents for each issue of a journal OR search for your topic within a specific journal

View journal contents via the BrowZine database; full text articles are available, if we subscribe to journal
**ACP Journal Club** summarizes the best new evidence for internal medicine from over 120 clinical journals. Search ACP Journal Club **Archives (1991-2008)** and from 2008 to the current year as a monthly feature in **Annals of Internal Medicine**

**Web search engines**

Returns high quantity of results from the full range or sources available on the web. Results are determined by a formula involving popularity and relevancy. May not be the best place to start for scholarly research.

**Example:** Google, Google Scholar

**Types of Literature**

Try to find peer reviewed RESEARCH ARTICLES from academic journals

**Journal** articles are written by a researcher or scholar for a specific field, some are reviewed by peer scholars before publication.

You may want to find a review of the literature for **background information**

**Your PICO question** will often require a specific type of study design to answer the question (e.g., Clinical Trials, Randomized Controlled Trials, Systematic review, Qualitative Studies, Quantitative studies, Meta-Analysis, or Comparative Study)

- Questions about **Diagnosis** ~ find prospective studies, blind comparison to a gold standard
- Questions about **Therapy** ~ find Randomized Controlled Trials (RCTs), meta-analysis, systemic reviews
- Questions about **Prognosis** ~ find cohort studies, case control or case series
- Questions about **Harm or Etiology** ~ find RCTs, cohort studies, case control, or case series
- Questions about **Prevention** ~ find RCTs, cohort studies, case control, case series, meta-analysis, systematic reviews
- Questions about **Cost Analysis** ~ find economic analysis

For **Qualitative** articles ~ find qualitative studies (e.g. grounded theory, phenomenological, ethnographic, etc.)

You may want to **exclude** Letters, Editorials, Comments, Meeting Abstracts, and Book Reviews

**USE Boolean Operators** - Insert AND, OR and NOT into your search to broaden or narrow it.

**Example** obese **OR** obesity **OR** overweight will broaden your results

**Example** nursing practice **AND** refugees will narrow your results (links different concepts that must be included)

**Example** Puerto Ricans **NOT** Mexican Americans will exclude irrelevant terms, but use with CAUTION!
MORE tips

Use an Asterisk * to truncate a root word for more terms (e.g. mimic* will find mimic, mimics, mimicking)

Use double Quotes to search an EXACT phrase, use with caution.

Use a search tag to indicate term should be found in a specific place: beverage*[ti] AND "Portion Size"[Mesh]

Use Parentheses if you are using more than one Boolean

Check limits that pertain to your search: __Age __English Language __Year of Publication __Peer Reviewed Journal

Step 3. Let’s take our keywords (natural language) and search in CINAHL Plus with Full Text

EBSCO platform provides multiple search boxes. Put one topic on each line and click Search

Enter key term(s) in search box (similar concepts are combined with OR), and click Search button
Narrow topic by adding (select AND) another concept (e.g. journal name or author name)

Use the pull-downs in Select a Field if you want to look for words in a specific part of the citation (e.g. title, author, or abstract fields)
– remember this may drop important articles!

Click Search History located below search box to manipulate search sets, if desired

Click Show More under Refine Results on left to filter results in one step:
Select Peer Reviewed, English, Research Article, Publication Date
From the Publication Box select Review, Guidelines, if needed

Note: If you choose “Limit to Full Text” you will not get the UCONN Links!!
EXPAND your keywords

Find more precise terms-Click **article title** to view the **CINAHL Subjects (Major/Minor)**

To **find** a CINAHL subject heading, type **one** term/phrase in the search box (e.g. **cell phone**) and check **Suggest Subject Terms** box, click **Search**

Your results show that the correct CINAHL Heading is **Cellular phone**, check box next to term.
NOTE, *Cellular phone* is a broad term with narrower concepts under it (e.g. Smartphone, texting), you may wish to include the narrower terms by selecting the **Explode** box.

A middle column for **Subheadings** appears which allows you to zero in on a specific aspect of cellular phones, but we will not select a subheading for this exercise.

**Scope** provides you with the definition and search hints.

Scroll down to bottom of page and click **Browse Additional Terms**. Type *Contamination*, click **BROWSE** and select the **broader** term *Microbial Contamination* (click Scope note for the definition and suggestions)

Change the radio button from **OR** to **AND** before you click **Search Database** (both concepts have to be in the article)  
Click **Search Database** which will run the search and return to the main page

You will see this on the main page:

(MH "Cellular Phone") AND (MH "Microbial Contamination") the “+” sign represents an explodable term

**Expand your search** using other CINAHL Subject Headings:
(MH "Cellular Phone+" OR MH "Computers, Hand-Held+" OR MH "Wireless Communications") AND (MH "Microbial Contamination+" OR MH "Equipment Contamination")

Open the full text document to Read article to build search term list, to look at the bibliography in each article to make sure you have the titles. If you discover an article title that you should have found, find out how that article is indexed.

Copy/paste an article title of interest in Scopus to find other articles that have cited that article.

**Run same search in different EBSCO databases without retyping your strategy!**

Step 1. Click Choose Databases to navigate to other EBSCO Databases

![Choose Databases](image)

Step 2. **Deselect the database you were in** (e.g. CINAHL Plus with Full Text) - just remove check mark in box

Step 3. **Select the box next to a new database** (e.g. Academic Search Premier) – one database at a time

Step 4. Click OK button and your search will now run in Academic Search Premier

![Choose Databases](image)

Step 5. Click **Search button** to run the search in the new database

Step 6. Click **Select all** and then click **Refresh Search Results** button.

**NOTE:** Subject Headings are unique to each database, so CINAHL Subject Headings may have zero results in Academic Search Premier.
Let's run the same search in PubMed.  [NOTE that a new version of PubMed will occur in December 2019]

Click Search History in CINHAL and copy best search strategy, then paste in PubMed search box, click Search.
Use parentheses to delineate each topic or group synonyms.
This example will find terms anywhere in the record: (contamination OR cross infection) AND (cell* phone* OR smartphone)

PubMed retrieves huge results! View Search Details on the results page to see the query translation and irrelevancy.  [All Fields means your keyword or phrase will be found anywhere in the record (e.g. journal, author, abstract, author institution, etc.)]

Narrow results further by searching terms as a phrase in specific fields – always use Caution!
- Use [ti] to find terms in the title; use [tiab] to find terms in the title or abstract
  - “cell phones”[ti] will find the phrase in the title
  - cell[ti] phones[ti] will find the words anywhere in the title

To view MeSH, click article title, scroll below the abstract, then click MeSH link, add MeSH terms to your search

Click Advanced under search box to review search history

NOTE: The current PubMed allows you to view search results using a Best Match Sort Order.  The New PubMed will automatically do a Best Match.

Use CAUTION, the Best Match is an algorithm and may not give the same results as a keyword/Mesh search. You can toggle under Sort By and choose, Most Recent or Best Match.
To filter your results, click Show Additional Filters on left navigation column to view more options (e.g. languages, journal subsets)

Check the Languages box, click SHOW, then select English to activate

Click Customize under Ages, select your filter (e.g. newborn: birth-1 month), click SHOW, activate your filters

For more Article Types (e.g. Practice Guidelines, Systematic review, Meta-analysis, Randomized Controlled Trials), click Customize under Article Types, select article type to show, click Show, then activate your filters. Do not use the Full Text or Free Full Text filters!
Click title of article to find UCONN Full Text and the full text. This example shows a full text link from PMC & UCONN Full Text

Send your total results to the Clipboard icon to print results, email results, to save in your My NCBI Collections, or to export results to RefWorks. Select citations by clicking the check box next to them. From the Send to menu, select Clipboard; then click the Add to Clipboard button. Click the Clipboard items link to view citations. Clipboard items will be stored for eight hours.

Advanced PubMed Tips:

Use PubMed Clinical Queries to find clinical research articles quickly. It is not as comprehensive as PubMed. Find link on the PubMed homepage.

Advanced search using MeSH Terms for precision (MeSH defines the content of the article.) Many citations are indexed with MeSH Terms, just click MeSH Terms link below the abstract or PMID number to view
Use the drop-down search menu to access the **Mesh** database. Search for a term or concept, e.g., *cell phones*, and click **Search**.

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**Step 2.** Results bring up one Mesh term, *cell phone*, click the **ADD to Search Builder button** on the right side which will populate the PubMed Search Builder box. You can also select subheadings, if needed. If multiple items are retrieved click on the desired term.

**Step 3.** Clear screen and type *nosocomial infections*; click Search

**Step 4.** Select MeSH term *Cross Infection*; click **ADD to Search Builder using AND**

**Step 5.** Click **Search PubMed** to return to PubMed and view your results
PubMed has a special filter that allows you to limit a search to systematic reviews or to meta-analysis. Systematic [sb] (12/18)

- Add systematic [sb] or meta-analysis[sb] to your Search set
- “heart diseases”[mesh] AND systematic[sb]
- You can also select these filters from the Article Types column on your results page

**Use our RESEARCH GUIDES for more help**
Examples: Health Subject Guide or Psychology Subject Guide or Citation Guides

**ORGANIZE YOUR RESEARCH**

Set up a MY EBSCOhost account to save your work in EBSCO databases:

Select **Sign In** located on the top tool bar to create a new account

Click blue icon located next to article title you want, once article is saved it turns yellow

Once you save articles, click open folder to view you saved citations

If you close your browser without saving your work to your my EBSCOhost account you will lose your temporary folder and the contents! 😞

Set up a My NCBI account to save your work in PubMed

Select **Sign in to NCBI** click Register for an NCBI account and create account

Click the box next to the article title you want and send to Clipboard. When finished save to Collections or export to RefWorks.

Save your search, save your references, set up search alerts, turn on highlighting for ease of searching

**Use a Citation Manager/Reference Manager**

An online tool or desktop software used to organize and store citations and full-text articles or other documents, create bibliographies, insert in-text citations into a paper, and share references with research partners.

Examples: RefWorks, Mendeley, Zotero
RETRIEVING FULL TEXT ARTICLES:

To find all UConn full text articles when searching our databases, NEVER limit your retrieval to full text!

Look for:

- PDF symbol which will automatically give you the PDF article
- HTML symbol which will give you the article in HTML format

**UCONN Links** if PDF symbol is not given, click **UCONN Full Text**

**UCONN Full Text may provide** a link to the article, journal website (from there you can search for the article), or a link to order the article from Interlibrary Services. The scanned article will be sent you via your UConn email.

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**Sources for finding Guidelines and/or research**

Funding support for the National Guideline Clearinghouse ended on July 16, 2018. Find clinical practice guidelines or guidelines by searching the following tools:
- PubMed - Search your concept, on the results page, click *Article Types* option (located on the left side of the screen) for Practice Guideline. Selecting an Article Type is a 3-step process: 1) Click **More** under Article Types; 2) Check the box for **Practice Guideline** and click [Show]; **Practice Guideline** will now show on left column; 3) Click it once more to limit results to practice guidelines.
- *Current Practice Guidelines in Primary Care 2019* via AccessMedicine database
- DynaMedPlus – Search your topic and append guidelines
- ECRI Institute Guidelines Trust - provides limited access for free; limited number of guidelines. Requires (free) registration.
- National Institute of Nursing Research
- TRIP - *Turning Research Into Practice*; search by keyword, then click link for Guidelines on the results page
- U.S. Preventive Services Task Force Recommendations (USPSTF)

**Evidence Based Medicine (filtered) databases ~ Sorry, we do not have UpToDate!**
- Clinical eCompanion – [http://ecompanion.pitt.edu](http://ecompanion.pitt.edu)
- Cochrane Database
- DynaMed Plus
- Essential Evidence Plus
- PubMed Clinical Queries
- SpeechBite (An Australian database of intervention studies in speech pathology [http://speechbite.com](http://speechbite.com))

**UConn E-Journals that focus on Evidence Based Practice - a sample list**
- The ACP Journal
- Clinical Nursing Research
- Evidence Based Nursing
- Evidence Based Mental Health
- Evidence Based Medicine (EBM Online)
- International Journal of Evidence-Based Healthcare
- Journal of Family Practice
- Worldviews on Evidence-Based Nursing

**EBM Tutorials for nurses (also listed in Health Subject Guide)**
- [Evidence Based Practice - an inter-professional tutorial](http://evidencebasedpractice.org) Created by the University of Minnesota.
- [Introduction to Evidence Based Practice](http://evidencebasedpractice.org) Created by Duke University.
- [Nursing EBP Tutorial](http://ecompanion.pitt.edu) Created by UConn Health
- [Evidence Based Practice Toolkit for Nursing](http://ecompanion.pitt.edu) Created by Oregon Health & Science University
- [EBM Tools](http://ecompanion.pitt.edu) Created by the Centre for Evidence Based Medicine, Toronto.
Evidence Based Medicine Research Centers:

- Agency for HealthCare Research & Quality (AHRQ) [https://ahrq.gov](https://ahrq.gov)
- Canadian Task Force on Preventive Health Care [https://canadiantaskforce.ca](https://canadiantaskforce.ca)
- Centre for Reviews and Dissemination [https://www.crd.york.ac.uk/crdweb/](https://www.crd.york.ac.uk/crdweb/)
- Centre for Evidence Based Medicine (Oxford) [https://www.cebm.net/](https://www.cebm.net/)

Keep Current - Set up Email Alerts or RSS feeds

- Becker’s Hospital Review [https://www.beckershospitalreview.com/](https://www.beckershospitalreview.com/)
- BMJ Evidence Centre (free monthly alerts) [http://clinicaledvidence.bmj.com](http://clinicaledvidence.bmj.com)
- Evidence Alerts (from McMaster Plus & DynaMed Plus) [https://plus.mcmaster.ca/EvidenceAlerts/](https://plus.mcmaster.ca/EvidenceAlerts/)
- Health Affairs Blog: [https://www.healthaffairs.org/blog](https://www.healthaffairs.org/blog)
- Medical News Today [http://www.medicalnewstoday.com](http://www.medicalnewstoday.com)
- The Pennsylvania Patient Safety Authority: [http://patientsafetyauthority.org/Pages/Default.aspx](http://patientsafetyauthority.org/Pages/Default.aspx)

Click [Ask A Librarian](mailto:valori.banfi@uconn.edu) located on the library website if you have a question.

You can also contact Valori Ann Banfi valori.banfi@uconn.edu or at 860-486-2824 8/13/19

Some of the ideas for formatting in this handout came from Kathy Kavanagh Webb, Research & Instructional Services Librarian [kavanaghk@ecu.edu](mailto:kavanaghk@ecu.edu) & Elsevier’s Library Connect