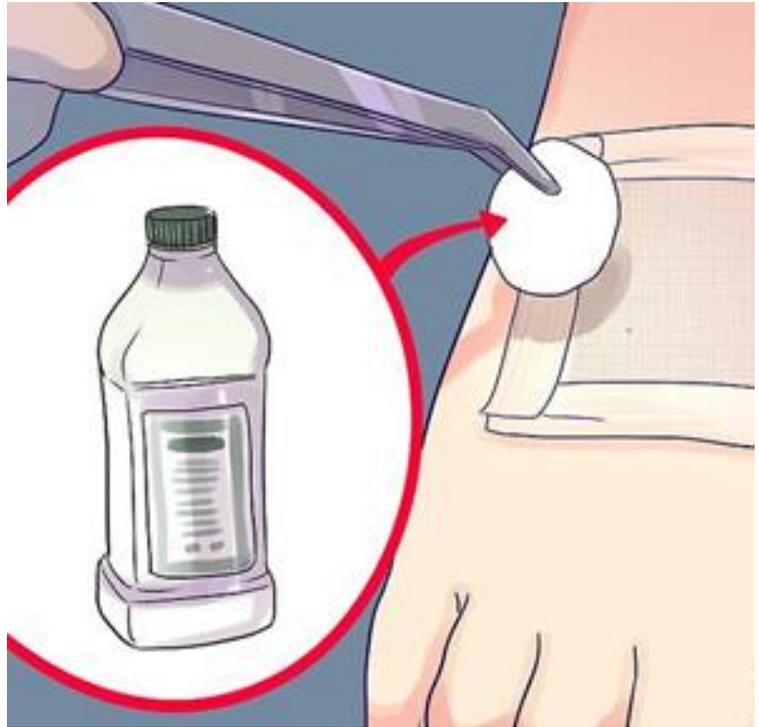


## Chapter 2

# Fundamentals of Evidence-Based Nursing Practice



1

### What is Evidence Based Practice (EBP)?

- **EVIDENCE BASED PRACTICE** → is “the integration of best research evidence with clinical expertise and patient values” (Sackett et al., 2000)

→ **EVIDENCE BASED PRACTICE** = The process of shared decision-making between practitioner, patient, and family.

→ Based on:

- research evidence,
- the patient's experiences and preferences,
- clinical expertise or know-how,
- and other available robust sources of information



2

- KEY TO EBP is:
  - Effort to personalize “best evidence” to a specific patient’s needs within a particular context.
- BASIC FEATURES
  - It de-emphasizes decisions based on custom, authority, or ritual.



3

- **Evidence-based practice (EBP)** is a way of approaching decision making about clinical issues.
- It is a means of **making decisions**:

- **with the best and most current knowledge possible from science and from practice**
- as that **knowledge is interpreted by a clinician** (with that person's expertise, experience, life knowledge and intuition completely integrated into the interpretation)
- and **with the collaboration with the patient**, where the doctor or nurse values what s/he wants as the outcome for this decision and why.



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- **Patient preferences**, as they are called, sometimes change when clinicians explain the science as interpreted through their expertise
- → we call these: **INFORMED PATIENT PREFERENCES**. This enables the best outcome to be achieved for that patient.



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### Research Utilization (RU) Versus Evidence-Based Practice (EBP)

- **Research utilization (RU)**

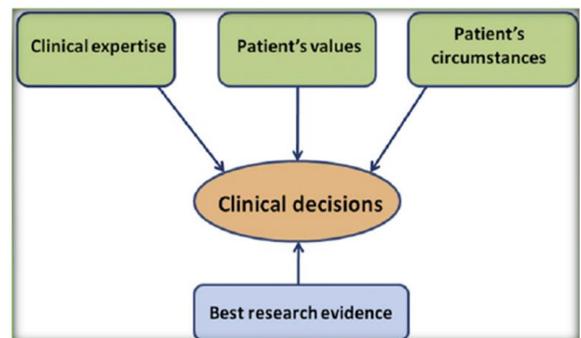
Is the **use of study findings** in a practical application unrelated to the original research (use of the findings in your practice)

**“How can I put this new knowledge to good use in my clinical setting?”**

- **Evidence-based practice (EBP)**

Basing **clinical decisions** on best possible evidence, typically high-quality research

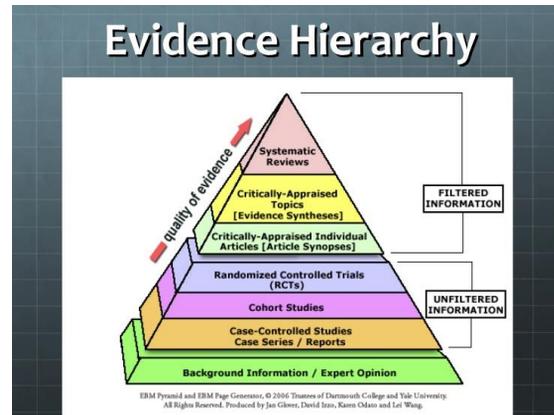
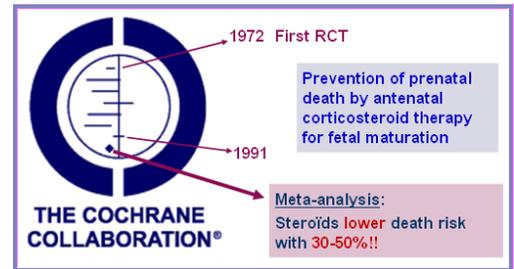
**“What does the evidence say is the best approach to solving this clinical problem?”**



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## Cochrane Collaboration

- Keystone of the EBP movement
- Founded in the UK, based on the work by British epidemiologist Archie Cochrane.
- 1970 → publish a book that **drew attention to the shortage of solid evidence about the effects of health care.**
  - → called for efforts to make research summaries about interventions available to health care providers. → **Proposed an evidence hierarchy** for weighing evidence
    - This led to the development of the Cochrane Center (1993) and the International Cochrane Collaboration
    - To prepare and disseminate systematic reviews of the effects of health care intervention



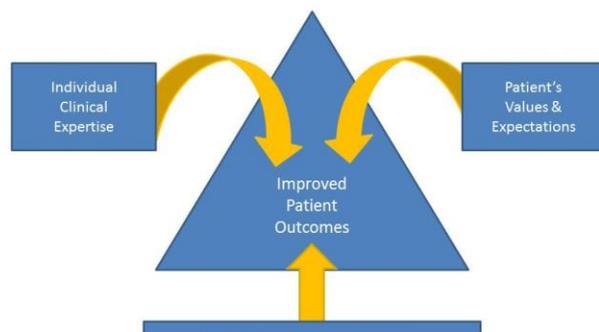
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## evidence-based medicine

- At about the same time, a group from McMaster Medical School in Canada developed a learning strategy they called evidence-based medicine.
- The evidence-based medicine movement, pioneered by Dr. David Sackett, has broadened to the **use of best evidence by all health care practitioners.**
- EBP has been considered a **major paradigm** shift in health care education and practice.
- With EBP, skillful clinicians can no longer rely on a repository of memorized information but rather must be adept in accessing, evaluating, and using new research evidence.

### The Evidence-Based Medicine triad

(see D.L. Sackett et al, BMJ 1996; 312: 71-72)



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## Advocates and Critics of EBP

### • Supporters:

- **rational approach** to providing the best possible care with the most cost-effective use of resources.
- **provides a framework** for self-directed lifelong learning that is essential in an era of rapid clinical advances and the information explosion.

### • Critics:

- the advantages of EBP are **exaggerated**
- individual clinical judgments and patient inputs are being **devalued**.
- insufficient attention is being paid to the role of **qualitative research**.



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## Knowledge Translation

### RU (Research Utilization) and EBP :

- can be by individual nurses or at a higher organizational level (by nurse administrators, etc.)
- efforts to bridge the gap between knowledge generation and use.
- **Knowledge translation (KT)** → efforts to enhance systematic change in clinical practice.
- The WHO (2005) defined KT as “the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people’s health.”

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## Knowledge translation (KT)

- is the umbrella term for **all of the activities involved in moving research** from the laboratory, the research journal, and the academic conference **into the hands of people and organizations who can put it to practical use.**



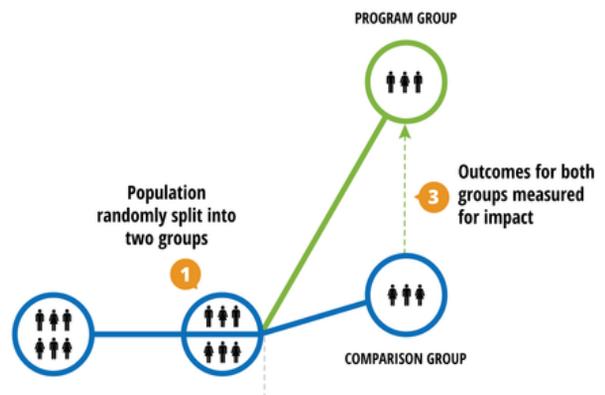
**Knowledge Translation is the bridge between discovery and impact**



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- There is not a consensus about What constitutes usable evidence for EBP
- Findings from rigorous research are paramount.
- What qualifies as “best” evidence?
  - Early in the EBP movement, there was a strong bias favoring evidence from a type of study called a **randomized controlled trial (RCT)**.
    - Initial focus of Cochrane Collaboration => effectiveness of therapies rather than broader health care questions.
  - RCTs are especially well-suited for drawing conclusions about the effects of health care interventions

## Randomized Controlled Trials (RCTs)



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- **Today:** contribution of various types of evidence are less rigid than previously.
  - Nevertheless we have evidence hierarchies
- **RCTs are near the top of these hierarchies. A systematic review of RCTs are considered stronger evidence)**
- **Level I = systematic reviews of multiple RCTs** => at the pinnacle of the hierarchy (Level I) because the strongest evidence comes from careful syntheses of multiple studies.
- **Level II = individual RCTs** → Therapy questions regarding the efficacy of a therapy or intervention (*What works best for improving health outcomes?*)
- **Level III** => type of study called quasi-experimental.

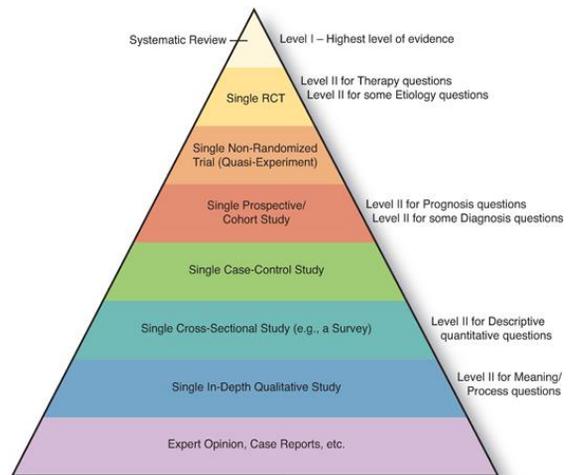


Figure 2.1 Evidence hierarchy: levels of evidence for different EBP questions.

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## EBP CHALLENGES

### Barriers to RU and EBP in Nursing:

- 1) **Research-related barriers:**
  - Quality and nature of research
  - Scarcity of published replications
- 2) **Nurse-related barriers:**
  - inadequate skills in locating and appraising evidence
- 3) **Organizational barriers:**
  - lack of financial support and staff release time for EBP



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## INADEQUATE SKILLS

- This class is designed to eliminate this barrier
- **You will be an asset to ANY organization having learned the skills of EBP**
- Put this course on your resume, and talk about it in interviews!



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### Question

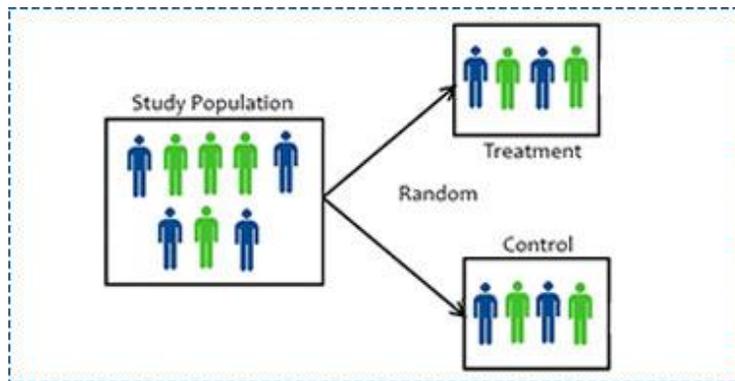
Is the following statement True or False?

- The strongest level of evidence is obtained from individual correlational studies.
- [True](#)
- [False](#)

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- False

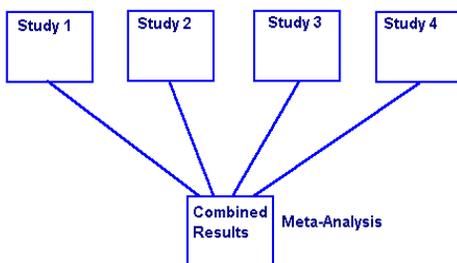
- The strongest level of evidence is obtained from systematic reviews of randomized clinical trials (RCTs).



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## Key Resources for RU/EBP are:

- **Systematic reviews** that integrate evidence about a topic (ex: wound care) in a rigorous, systematic way
  - **Meta-analyses** = integrate findings across **Quantitative** Studies statistically
  - **Meta-syntheses** = integrate and amplify findings across **Qualitative** studies



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## RESOURCES FOR EVIDENCE-BASED PRACTICE

### Pre-Appraised Evidence Research evidence:

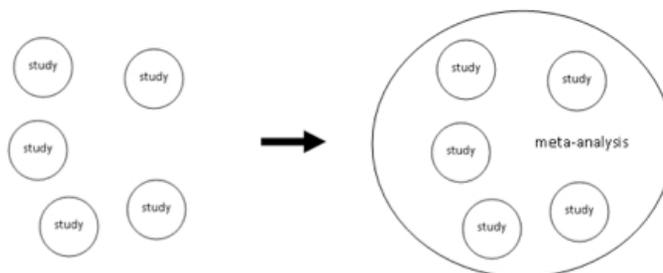
- Preprocessed (pre-appraised) evidence → is evidence that has been selected from primary studies and evaluated for use by clinicians.
  - The majority are from individual studies.
  - Primary studies published in journals are not pre-appraised for quality and use in practice.
  - DiCenso and colleagues (2005) → hierarchy of preprocessed evidence:
    - 1) 1<sup>st</sup> rung above primary studies => synopses of single studies
    - 2) systematic reviews
    - 3) synopses of systematic reviews.

### Clinical practice guidelines are at the top of the hierarchy

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## Systematic Reviews

- EBP relies on **meticulous integration of all key evidence on a topic** so that well-grounded conclusions can be drawn about EBP questions.
- A systematic review is not just a literature review.
- A systematic review is in itself a methodical, scholarly inquiry that follows many of the same steps as those for other studies.

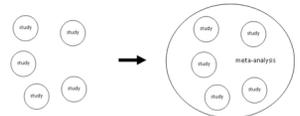


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## Systematic Reviews

Systematic reviews can take various forms:

- META-SYNTHESIS → **narrative** (qualitative research) **integration** that merges and synthesizes findings, much like a rigorous literature review.
- META-ANALYSIS → is a technique for **integrating quantitative** research findings **statistically**.
- META-ANALYSIS treats the findings from a study as one piece of information. **The findings from multiple studies on the same topic are combined and then all of the information is analyzed statistically** in a manner similar to that in a usual study.
- Thus, instead of study participants being the unit of analysis, individual studies are the unit of analysis in a meta-analysis.
- META-ANALYSIS provides an objective method of **INTEGRATING A BODY OF FINDINGS** and of **OBSERVING PATTERNS** that might not have been detected.



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- Systematic reviews are increasingly available.
  - => published in professional journals that can be accessed using standard literature search procedures (Chapter 7)
  - also available in databases that are dedicated to such reviews. (Ex: Cochrane Database of Systematic Reviews (CDSR))

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## Clinical Practice Guidelines and Care Bundles

- EVIDENCE BASED CLINICAL PRACTICE **GUIDELINES** is a body of evidence into a usable form.
- Unlike systematic reviews, **clinical practice guidelines** (which often are based on systematic reviews) **give specific recommendations for evidence-based decision making.**
- Guideline development typically involves the **consensus of a group of researchers, experts, and clinicians.**

## Care Bundle

- **A care bundle is .....**  
**“A systematic method of measuring and improving clinical care processes based on groups of care elements for particular diagnoses and procedures”**

NHS Modernization Agency



Deepthi R.MSN

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## Clinical Practice Guidelines and Care Bundles

- The implementation or adaptation of a clinical practice guideline is often an ideal focus for an organizational EBP project.
- Also, organizations are developing and adopting CARE BUNDLES—a concept developed by the Institute for Healthcare Improvement—that encompass a SET OF INTERVENTIONS TO TREAT OR PREVENT A SPECIFIC CLUSTER OF SYMPTOMS (WWW.IHI.ORG).
- **There is growing evidence that a combination or bundle of strategies produces better outcomes than a single intervention.**
- **Example of a care bundle: Ventilator care bundle**

### Ventilator Associated Pneumonia Care Bundle -Evidence Based Practices

- Head Of Bed elevated to **30°–45°**
- Daily **sedation vacation** & daily assessment of readiness to wean
- **DVT Prophylaxis**
- **Stress Ulcer Prophylaxis**
- **Subglottic secretion drainage**
- Daily mouth care with **chlorhexidine**

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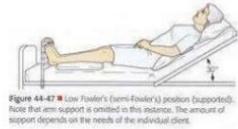
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- Example of a care bundle project :
- Tayyib et al. (2015) studied the effectiveness of a pressure ulcer prevention **care bundle in reducing the incidence of pressure ulcers** in critically ill patients.
- Patients who received the bundled interventions had a significantly lower incidence of pressure ulcers than patients who did not.
- **Ventilator-associated pneumonia (VAP)** is pneumonia that develops 48 hours or longer after mechanical ventilation is given by means of an endotracheal tube or tracheostomy.
- Ventilator-associated pneumonia (VAP) results from the invasion of the lower respiratory tract and lung parenchyma by microorganisms.

## VAP BUNDLE

- Elevation of head of bed
- Daily sedation and vacation and readiness of patient to extubate
- Peptic ulcer prophylaxis



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- Finding care bundles and clinical practice guidelines can be challenging because there is no single guideline repository.
- A recommended approach is to search in guideline databases or through specialty organizations that have sponsored guideline development.
- U.S. nursing and health care guidelines are maintained by the National Guideline Clearinghouse ([www.guideline.gov](http://www.guideline.gov)).

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- There are still many topics for which practice guidelines have not yet been developed,
- Or also → we may find multiple guidelines on the same topic.
- Or → differences in the rigor of guideline development and interpretation of evidence, different guidelines sometimes offer different or even conflicting recommendations
- who wish to adopt clinical practice guidelines **should appraise them** to identify ones that are based on the **strongest evidence**, have been **meticulously developed**, are **user-friendly**, and are **appropriate for local use** or adaptation.
- Several APPRAISAL INSTRUMENTS are available to evaluate clinical practice guidelines –
  - Appraisal of Guidelines Research and Evaluation (AGREE) Instrument,

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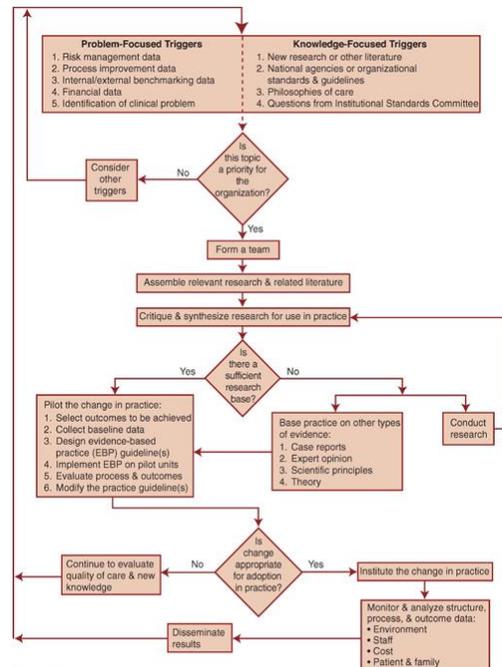
### Models of the Evidence-Based Practice Process:

- Advancing Research and Clinical Practice Through Close Collaboration (ARCC) Model (Melnyk & Fineout-Overholt, 2015)
- Diffusion of Innovations Model (Rogers, 1995)
- Iowa Model of Evidence-Based Practice to Promote Quality Care (Titler, 2010)
- Johns Hopkins Nursing Evidence-Based Practice Model (Dearholt & Dang, 2012)
- Promoting Action on Research Implementation in Health Services (PARiHS) Model, (Rycroft-Malone, 2010; Rycroft-Malone et al., 2013)
- Stetler Model of Research Utilization (Stetler, 2010)

*Each model offers different perspectives on how to translate research findings into practice, but several steps and procedures are similar across the models.*

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# EVIDENCE-BASED PRACTICE IN INDIVIDUAL NURSING PRACTICE



**Figure 2.2** Iowa Model of evidence-based practice to promote quality care. (Adapted with permission from Titter, M. G., Kleiber, C., Steelman, V., Rakel, B., Budreau, G., Everett, L. O., . . . Goode, C. (2001). The Iowa model of evidence-based practice to promote quality care. *Critical Care Nursing Clinics of North America*, 13, 497–509.)

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## Asking Well-Worded Clinical Questions: PIO and PICO

- This is a crucial first step in EBP → to ask relevant clinical questions that reflect uncertainties in clinical practice.
- Some EBP writers distinguish between background and foreground questions:
  - **Background questions** → foundational questions about a clinical issue
    - Ex: What is cancer cachexia (progressive body wasting), and what is its pathophysiology?
    - The Answers are found in textbooks.
  - **Foreground questions** => can be answered based on current best research evidence on diagnosing, assessing, or treating patients or on understanding the meaning or prognosis of their health problems.
    - Ex: is a fish oil–enhanced nutritional supplement effective in stabilizing weight in patients with advanced cancer?
    - The Answer may provide guidance on how best to address the needs of patients with cachexia.

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## Asking Well-Worded Clinical Questions: PIO and PICO (cont.)

- Most guidelines for EBP use the acronyms PIO or PICO

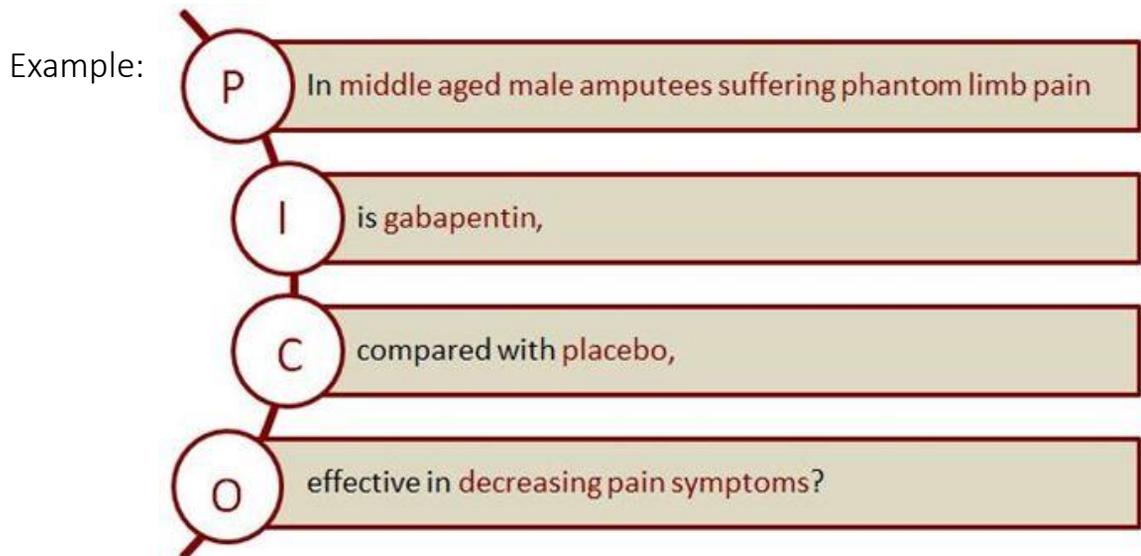
**P**: the **population** or patients (What are the characteristics of the patients or people?)

**I**: the **intervention**, influence, or exposure (What are the interventions or therapies of interest? or What are the potentially harmful influences/exposures of concern?)

**C**: **comparison**

**O**: the **outcomes** (What are the outcomes or consequences in which we are interested?)

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## Questions Templates for PIO and PICO

TABLE 2.1 Question Templates for Selected Clinical Foreground Questions: PIO and PICO

Type of Question	PIO Question Template (Questions Without an Explicit Comparison)	PICO Question Template (Questions With an Explicit Comparison)
Therapy/treatment/intervention	In _____ (Population), what is the effect of _____ (Intervention) on _____ (Outcome)?	In _____ (Population), what is the effect of _____ (Intervention), in comparison to _____ (Comparative/alternative intervention), on _____ (Outcome)?
Diagnosis/assessment	For _____ (Population), does _____ (Identifying tool/procedure) yield accurate and appropriate diagnostic/assessment information about _____ (Outcome)?	For _____ (Population), does _____ (Identifying tool/procedure) yield more accurate or more appropriate diagnostic/assessment information than _____ (Comparative tool/procedure) about _____ (Outcome)?
Prognosis	For _____ (Population), does _____ (Exposure to disease or condition) increase the risk of _____ (Outcome)?	For _____ (Population), does _____ (Exposure to disease or condition), relative to _____ (Comparative disease or condition) increase the risk of _____ (Outcome)?
Etiology/harm	In (Population), does _____ (Influence, exposure, or characteristic) increase the risk of _____ (Outcome)?	Does (Influence, exposure, or characteristic) increase the risk of _____ (Outcome) compared to _____ (Comparative influence, exposure or condition) in _____ (Population)?
Description (prevalence/incidence)	In _____ (Population), how prevalent is _____ (Outcome)?	<i>Explicit comparisons are not typical, except to compare different populations.</i>
Meaning or process	What is it like for _____ (Population) to experience _____ (situation, condition, circumstance)? <b>OR</b> What is the process by which _____ (Population) cope with, adapt to, or live with _____ (situation, condition, circumstance)?	<i>Explicit comparisons are not typical in these types of questions.</i>

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### Appraising the Evidence for Evidence-Based Practice

- Evidence should be **appraised before clinical action** is taken.
- critical appraisal of evidence => focuses primarily **on evidence quality**.



### Questions for Appraising the Evidence:

1. What is the **quality of the evidence**—i.e., how rigorous and reliable is it?
2. What is the evidence—what is the **magnitude of effects**?
3. How precise is the **estimate of effects**?
4. What evidence is there of any **side effects/side benefits**?
5. What is the **financial cost** of applying (and not applying) the evidence?
6. Is the evidence **relevant to my particular clinical situation**?

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## Appraising the Evidence for Evidence-Based Practice

### 1. Evidence Quality :

- Were the study **methods sufficiently rigorous** that the evidence can be trusted?

### 2. Magnitude of Effects :

- **whether study findings are clinically important** → **how powerful the effects are.**
  - *Example:* “Does the use of compression stockings lower the risk of flight-related deep vein thrombosis for high-risk patients? “
    - The conclusion of two systematic reviews, based on reliable evidence, was that compression stockings are effective, and **the magnitude of** the risk-reducing effect is fairly substantial.
    - Thus, advice about using compression stockings may be appropriate, pending an appraisal of other factors.
    - The magnitude of effects can be quantified

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## Appraising the Evidence for Evidence-Based Practice



### 3. Estimate of effects (Precision of Estimates):

- **Quantitative study** → **Confidence Interval** shows how precise the estimate of effect is
- research results provide only an **estimate of effects**, and it is useful to understand not only the exact estimate but also the range within which the actual effect probably lies.

### 4. Side effects/Side benefits (Peripheral Effects):

- Even if the evidence is judged to be valid and the magnitude of effects is **sizeable**, **peripheral benefits and costs may be important in guiding decisions.**
- In framing your clinical question, you would have identified the outcomes (O) in which you were interested
  - *Example:* weight stabilization for an intervention to address cancer cachexia. BUT what would be the effects on quality of life?

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## Appraising the Evidence for Evidence-Based Practice

### 5. Financial Costs:

- Of course, although **the cost of a clinical decision** needs to be considered, the cost of **not taking action** is equally important.

### 6. Clinical Relevance:

- Best practice evidence can most readily be applied to an individual patient in your care **if he or she is sufficiently similar** to people in the study or studies under review.
- Would your patient have qualified for participation in the study—or would some factor (age, illness severity, comorbidities, etc) have disqualified him or her?

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## Appraising the Evidence for Evidence-Based Practice

### Actions Based on Evidence Appraisals:

- **Appraisals of the evidence** may lead you to different courses of action:
  - conclude that the evidence base is **not sufficiently sound**
  - or that the likely **effect is too small**, or that the **cost** of applying the evidence is **too high**.
- The evidence appraisal may suggest that “usual care” is the best strategy.
- If, however, the initial appraisal of evidence suggests a promising clinical action, then you can proceed to the next step.

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## Integrating Evidence in Evidence-Based Practice



- **Research evidence** needs to be integrated with other types of information, including your own **clinical expertise** and **knowledge of your clinical setting**.
- **Patient preferences and values** are also important. A discussion with the patient may reveal negative attitudes toward a potentially beneficial course of action, contraindications (comorbidities), or possible impediments (lack of health insurance).
- → integrate evidence from Qualitative research
  - → evidence from an RCT may tell us whether a pill is effective, but qualitative research can help us understand why patients may not swallow the pill.



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## Implementing the Evidence and Evaluating Outcomes

*After the first 4 steps of the EBP process have been completed, you can use the resulting information to make an evidence-based decision or to provide evidence-based advice:*

1. Asking clinical questions that can be answered with research evidence
  2. Searching for and retrieving relevant evidence
  3. Appraising and synthesizing the evidence
  4. Integrating the evidence with your own clinical expertise, patient preferences, and local context
  5. Assessing the effectiveness of the decision, intervention, or advice
- 

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## Implementing the Evidence and Evaluating Outcomes

- Last step in an individual EBP effort => evaluation.
- => following up to determine whether your actions achieved the desired outcome.
- => evaluation of how well you are performing EBP.
- Sackett and colleagues (2000) self-evaluation questions:
  - Am I asking any clinical questions at all?
  - Am I asking well-worded questions?
  - Do I know the best sources of current evidence?
  - Am I efficient in my searching?

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## QUALITY IMPROVEMENT (QI) PROJECTS

- In recent years, there has been a lot of discussion in health journals about the **differences and similarities between QI projects and research**.
- In nursing, efforts have been made to **distinguish QI, research, and EBP projects**
  - All 3 have much in common:
    - → use of systematic methods of solving health problems
    - → **aim** => fostering improvements in health care.

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## QUALITY IMPROVEMENT (QI) PROJECTS

- Patient data are used in all three, and statistical analysis—sometimes combined with analysis of qualitative data.
- The definitions of QI, research, and EBP activities are distinct, and yet it is not always easy to distinguish them in real-world projects, resulting in confusion.
- **QI** has been defined by the U.S. Centers for Medicare & Medicaid Services (CMS) as “**an assessment, conducted by or for a QI organization, of a patient care problem for the purpose of improving patient care through peer analysis, intervention, resolution of the problem, and follow-up**” (CMS, 2003).
- **Research** is defined as a “**systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge**” (U.S. Code of Federal Regulations, 2009).
- **EBP** projects are efforts to translate “**best evidence**” into **protocols to guide the actions of health care staff to maximize good outcomes for clients**”.

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## QUALITY IMPROVEMENT (QI) PROJECTS

*Differences between the three → “All three have an important, but different, relationship with knowledge: research generates it, EBP translates it, and QI incorporates it”.*

- **Few characteristics of QI:**

=> intervention or protocol can change as it is being evaluated to incorporate new ideas or insights.

=> purpose => to effect immediate improvement in health care delivery.

=> designed with the intent of sustaining an improvement.

=> a necessary, integral activity for a health care institution; research is not.

=> A literature review may not be undertaken in a QI project.

=> QI projects are not externally funded

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