Essential Skills for Evidence-based Practice

How to Ask a Clinical Question

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Abstract

Nurses who wish to apply evidence to practice must be able to ask questions about clinical problems in a format that allows those questions to be answered with evidence. This article contains a discussion of the nature of the foreground clinical question in evidence-based practice (EBP) and instructions for constructing such questions. The benefits of this format for locating and evaluating evidence are explained.

Key words: Evidence-based practice (EBP), Essential Skills

Nurses recognize the need for evidence to guide their practice in many ways. They may be dissatisfied with the results of their care for a specific patient, or they may be aware of a chronic problem in their practice setting that affects many patients or care providers. Sometimes, nurses are faced with two or more ways of accomplishing some desired patient outcome and they may wonder whether one of the choices is more effective or efficient than the others. In these circumstances, nurses use their clinical expertise to assess what the problem is, define the desired outcome they hope to achieve and perhaps identify specific strategies that might be chosen to accomplish the outcome. The link between identifying the clinical problem and finding the best evidence to support a solution is the ability to frame the clinical problem as a question that can be answered by evidence. In evidence-based practice (EBP), this sort of question is called a foreground clinical question.

In the course of their practice, nurses ask many questions, and not all of them can or should be answered by a search for best evidence. Carper[1] suggests that nurses employ at least four ways of knowing in patient care: moral, aesthetic, personal and empiric. Moral knowledge raises ethical questions (see examples in Table 1). The answers to moral questions come from appeal to moral standards and consideration of the perspectives of all involved persons, rather than from observable (empiric) evidence. Aesthetic knowledge involves those issues that engage to our senses and emotions, leading to questions about beauty and appeal. Aesthetic knowledge supports the aspects of care we call the "art" of nursing. Any attempt to answer aesthetic questions with empiric evidence reminds us that beauty is, indeed, in the eye of the beholder. Personal knowledge involves those characteristics of the patient and nurse that are expressions of their uniqueness. We draw on this kind of knowledge to individualize our care of patients and to make therapeutic use of ourselves in nursing encounters. Empiric evidence can provide some information on the range of possibilities for personal qualities and preferences, but questions about personal knowledge are ultimately answered by personal reflection. Moral, aesthetic and personal ways of knowing are incorporated into evidence-based practice at the point when patient values are considered, along with evidence, to make clinical decisions.

It is Carper's empiric way of knowing that forms the basis for evidence-based clinical questions. Empiric knowing generally focuses on facts - those aspects of the world that we see, hear, smell, touch or taste. We can verify our observations as real because others can see, hear, smell, touch or taste them, also. It is common to make a distinction between objective (verifiable by many) and subjective (individual opinion) knowledge and to accept only objective knowledge as empiric evidence. Many important health phenomena, however, involve the patient's subjective knowledge and self-report. One example is pain: we accept the patient's report of pain as real to the patient, even though we cannot see, hear, smell, touch or taste the pain other than through the patient's actions and report.

Table 1 : Examples of Practice Questions Representing Carper's Ways of Knowing[1]

	Questions
Moral	Is quality of life more important than length of life? Is it the responsibility of nurses to relieve suffering whenever possible?
Aesthetic	Can I share what my patient feels in this situation? Will this tiny preterm infant look more appealing if I put a bow on her head?
Personal	Does my patient respond better to a hearty welcome or a gentle greeting first thing in the morning? Does my patient prefer to learn wound self care by reading a pamphlet or watching a video?
Empiric	For patients with insomnia, is cognitive behavioral therapy more effective than sedative medications for increasing the total number of sleep hours per night? What is the typical length of time between the first appearance of a shingles rash and complete recovery?

EBP clinical questions are all based in the empiric way of knowing, but not all empiric questions are clinical foreground questions. EBP differentiates between background questions and foreground questions. Background questions seek general knowledge, for example about disease and physiology, whereas foreground questions are specific questions about the care of the patient (see Table 2 for examples of both). The answers to background questions are typically found in textbook chapters and integrative or literature review articles, where general knowledge about a health situation is organized and summarized to enhance the reader's understanding. Foreground questions, however, require answers from strong and timely evidence sources, because those answers will be applied directly to the care of patients.

Table 2 : Examples of Background and Foreground Clinical Questions

Background Questions	Foreground Questions
1 How do wounds heal?	Do surgical incisions heal faster with dressings that restrict air flow to the incision or with dressings that allow free air flow?
2 What is the underlying mechanism of insulin resistance?	For overweight adults, does 5% weight loss and 150 minutes of exercise per week reduce the risk of developing Type II diabetes?
3 How does bone remodeling occur?	What are the behavioral risk factors associated with osteoporosis in older women?
4 What is autism?	How do parents of autistic children manage the task of finding appropriate educational environments for their children?

Most of the foreground questions that members of all health care disciplines ask about the care of their patients fall into four common domains: therapy, harm, diagnosis and prognosis. Therapy questions (see Table 3 for examples) address ways to accomplish a desirable objective for an individual patient or group of patients, or how to prevent an undesirable event from occurring. Harm (sometimes called etiology) questions address the causes of undesirable outcomes. Therapy and harm questions are very similar to each other, because the undesirable event in a harm question could easily be the object of preventive interventions in a therapy question. The most important difference between the two domains is that therapy questions involve outcomes that can be influenced through intentional actions. Harm questions may address such issues as unavoidable side effects of beneficial treatments or causes of harm that cannot be controlled by health care providers. In other words, therapy domain questions ask "how can I make this good thing happen for my patient?" and harm / etiology questions ask "what made this bad thing happen to my patient?"

While therapy domain questions arise frequently and naturally for nurses, diagnosis and prognosis domain questions are less

familiar. Diagnosis questions concern the accuracy of a diagnostic test, sign or symptom to determine whether a patient does or does not have a specific health problem. Prognosis domain questions address what is likely to happen in the future for someone with a specific health situation. The essential difference between the two domains is that diagnosis questions involve determining the current state of the patient's health, while prognosis questions involve what the patient can expect in the future, based on that current health state.

All health care providers are concerned with therapy, harm, diagnosis and prognosis domain clinical questions, but the core concerns of nursing practice lead to an additional domain of clinical foreground question: human response / meaning[2]. Foreground clinical questions in this domain seek information about the processes patients use to deal with their health situations, the meanings they attach to health experiences, and the contexts of their lives that influence their health care values. Although all health care providers need to incorporate patient values into evidence-based clinical decision-making, this information is uniquely important to nurses as the basis for holistic care.

Framing a clinical problem into a foreground clinical question involves making sure that all the important and relevant aspects of the problem are included in the question. The framework that has developed in EBP to accomplish this is called PICO, based on the first letters of the important elements of a therapy domain question. Each letter represents an independent component of the clinical question. **P** stands for the patient or population. This element includes the aspects of the patient characteristics that your clinical expertise tells you are important to the clinical problem. Typically, for therapy domain questions this involves the patient's medical diagnosis, the patient's health status and/or the patient's age group. **I** stands for intervention. If you are asking a therapy domain question, you may already be aware of some potential therapy intended to solve the clinical problem, and your foreground question is whether that therapy is effective and efficient. If so, you will be able to specify that therapy by name in the **I** element. **C** stands for comparison. It is possible that you are aware of more than one potential therapy intended to solve the clinical problem, and your foreground question concerns which of the two therapies is more effective. If so, the second therapy is specified by name in the **C** element. Otherwise, the implicit comparison in the **C** element is "usual care". **O** stands for outcome. This element specifies the desirable event that the therapy is intended to achieve.

Table 3 : Examples of Foreground Questions by Domain

Domain	Foreground Questions
Therapy	In community health settings, are group based interventions for smoking cessation more effective than individual interventions? Do pictures of peaceful landscapes decrease episodes of agitation for persons with dementia? Does patient positioning to avoid tension on the surgical incision reduce the need for pain medications in the immediate post-operative period? Do patients who receive IV fluids warmed to body temperature during surgery have fewer post-operative complications than patients who receive fluids at room temperature?
Harm / Etiology	Does living close to a high voltage electrical line increase the risk of brain tumors in children? What post-operative complications are more common with laparoscopic surgery, compared to an open procedure? Does massage of reddened skin areas cause further skin damage? Does postmenopausal hormone "replacement" increase the risk of breast cancer?
Diagnosis	How accurate is chest pain as a symptom of myocardial infarction in premenopausal women? How accurate is the XYZ screening tool in determining the risk for falls among community living older adults? Can electronic home monitoring systems detect impending heart failure before symptoms are apparent? Is the failure of a new mother to smile at her newborn an accurate indicator of potential for impaired parenting?
Prognosis	How likely are eating disorders to recur when young women go to college away from home? What is the five-year survival rate for elderly persons who have suffered a hip fracture? How long does it take for a woman to resume her normal activities following hysterectomy? What is the expected life span of a child with a major structural heart defect that has been surgically corrected?
Human Response / Meaning	How do persons with a diagnosis of borderline personality disorder experience their relationships with mental health professionals? How do adolescents deal with hair loss associated with cancer chemotherapy? What is the lived experience of a person whose spouse has suffered a traumatic brain injury? What values influence caregivers' decisions to offer or withhold narcotics as an option in acute pain management?

The important elements of harm, diagnosis, prognosis and human response/meaning clinical questions are somewhat different from those elements for therapy questions, but they can still be expressed in modified PICO format. Table 4 describes the modifications for each question domain and provides examples. For harm/etiology domain questions, the **P** element contains the same content as in therapy domain questions. The **I** element may no longer be an intentional intervention; however, the **I** element in a harm/etiology clinical question identifies the proposed cause of the undesired outcome (harm), whether it is an environmental exposure or a drug causing side effects. If your harm question is about a potential harmful exposure, the **C** element is the comparison to no exposure. If you want to compare two exposures to determine which one causes more harm, you may identify one as the **I** element and the other as the Celement. The **O** element is the undesirable outcome or specific harm in which you are interested.

Diagnosis clinical questions use the PICO elements in a somewhat different way, because the intent of a diagnosis question is to correctly determine the nature of the patient's problem, i.e. the diagnosis. The **O** of a diagnosis question, therefore, is the diagnosis to be confirmed or excluded. The **P** element typically identifies the presenting symptom or patient situation that requires diagnosis. The **I** element is the sign, symptom or test for which you want information about diagnostic accuracy. For many conditions, there is an existing way to establish the diagnosis that is generally recognized as being the most accurate available, called the "gold standard", and the performance of any new diagnostic strategy is compared to that "gold standard". If you can identify the "gold standard" on the basis of your clinical expertise, the "gold standard" becomes the **C** element in a diagnosis domain clinical question.

Prognosis domain questions also follow a modified PICO format, compared to therapy domain questions. The **P** element identifies the patient's current health situation, usually the diagnosis and the stage or severity of disease. The **O** element identifies the specific outcome of interest, for example death, full recovery, development of disability or development of a disease-related complication. The **I** and **C** elements may or may not be included. If you can identify some characteristic of the patient that is likely to alter the progression toward the outcome of interest, that becomes the **I** element. Such characteristics are often called

"risk factors". If your clinical question is about the relative impact of two different risk factors on the outcome of interest, you could include one as the **I** element and the other as the **C** element.

Questions from the human response/meaning domain follow a PICO format that is even further modified from therapy domain questions. The **P** element identifies the person or population of interest. The **I** element identifies the health situation with which the person is dealing. If you are interested in some characteristic of the person that might alter the person's response, for example age or ethnicity, that can be identified in the **C** element. Because the purpose of a human response/meaning question is to discover more about the ways persons manage and make sense of their health situations, you may not be able to be more specific about the **O** element than "response" or "meaning". If you are interested in a specific kind of response, for example "coping" or "body image", that specific term replaces the more general terms as the **O** element.

Table 4

Modifications of PICO Format for Clinical Question Domains

	P	I	C	O
Therapy	Patient / Population	Intervention	Comparison intervention or "standard care"	Desirable Outcome
Example:	*Community living adults*	*Group based interventions*	*Individual interventions*	*Smoking cessation*
Harm/Etiology	Patient / Population	Proposed cause of harm	Alternative cause or "no exposure"	Undesirable Outcome
Example:	*Children*	*High voltage lines*	*No exposure*	*Brain tumors*
Diagnosis	Presenting situation	Sign, symptom or diagnostic test	Gold Standard for establishing diagnosis	Diagnosis to be established
Example:	*Premenopausal women*	*Chest pain*	*EKG*	*Myocardial infarction*
Prognosis	Patient / Population current health situation	Factor that might influence outcome ("risk factor")	Additional factor that might influence outcome (may not be used)	Disease progression / occurrence of future Outcome of interest
Example:	*Young woman with history of eating disorder*	*Starting residential college*	--	*Recurrence*
Human Response / Meaning	Patient / Population	Health issue / situation of interest	Characteristics / contexts that may influence response	"Response" or "meaning" (specify type is known)
Example:	*Persons with borderline personality disorder*	*Relationship with mental health professionals*	---	*Meaning*

Why is the skill of formulating clinical questions in PICO format so important to EBP? First, this format allows you to conduct an effective and efficient search for evidence to answer your question in electronic databases. The terms identified as your PICO elements become the key words for your electronic search. The fact that each PICO element has content that is unique from the other elements lets you take advantage of Boolean ("AND"/ "OR") database search strategies to identify the most relevant literature quickly. A growing number of databases, moreover, provide special tools for locating "best evidence" that are based on the domain of question you are asking. If you have correctly identified the domain of question you are asking, these tools will help you find the evidence you need even if your PICO is incomplete.

Once you have located the relevant evidence, your knowledge of the domain of your question will also help you decide what questions to ask about the evidence to determine whether it is valid and whether it is clinically important enough to apply to practice. If you decide to apply the evidence in your clinical practice, the PICO format offers one final benefit: the **O** reminds you what outcomes need to be measured in order to determine whether the evidence is resulting in improvements in your practice.

An appropriately developed clinical question in PICO format represents careful clinical reasoning about the essential nature of the clinical problem, the characteristics of the patient and situation that will likely influence the outcome, and the specific outcomes of interest. For the purposes of helping you find the evidence to answer your question, each element of the PICO must represent a unique aspect of the problem in a short phrase, and all the essential elements must be included. Do not be discouraged by your first efforts to formulate a foreground clinical question in the PICO format. Thinking in this formal and organized fashion takes practice!

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