Evidence–based Medicine:
Asking The Answerable Question
(Question Templates as Tools)

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Asking Background and Foreground Questions

We introduce the evidence-based medicine (EBM) approach by distilling the process of asking an answerable question to a few easy steps. (1)

A promise made in our introduction to this series involved reviewing techniques whereby literature searches can be conducted more efficiently through the use of convenient tools. (2) Asking answerable clinical questions is the first of five steps in the EBM process that will deliver on this promise. The wisdom recently discovered in a Chinese fortune cookie presents an essential and relevant truth: "It is harder to ask the right questions than to find answers for the wrong questions." [Chinese Fortune Cookie (The Orient Express, Dayton, OH, 2002)].

Why is an EBM approach to formalizing a clinical question necessary? Asking questions helps to identify and satisfy our own learning needs, aids in communicating with our colleagues, and allows us to teach others by modeling sound EBM techniques. Improvement is needed in this particular skill. In a study examining "curbside consultations," clinical questions were more likely to be answered directly and less likely to require a formal consultation when the question defined clearly both a proposed intervention and a relevant outcome. (3) However, only about 40% of questions asked of consultants contained these two components. In addition, a well-developed question can be used as a tool that enables the physician to focus a search by using terms embedded within the question. A search stemming from a poorly formulated question often is not clear in its objectives, leads to pursuit of irrelevant ideas, reveals vague conclusions, and is likely to be too expansive in its results to be useful clinically. (4)

Tools Used in Crafting Background and Foreground Questions

The EBM toolbox (Figure) illustrates the tools available for crafting the answerable question. The concept of using background or foreground questions as tools to launch a relevant literature search can be illustrated by the following case.

A 2-year-old patient presents with a 12-month history of recurrent wheezing, cough, dyspnea, and mucopurulent nasal discharge. There are no smokers in the household, and all pets have been removed. Antibiotics and antihistamines have been tried without sustained benefit. Physical examination demonstrates normal growth and normal vital signs. Thick yellow nasal discharge is noted, and bilateral expiratory wheezes are heard on chest auscultation.

This problem is likely to be experienced in general pediatric practice. Rather than relying solely on past clinical experience and treatment habits, EBM attempts to integrate the best research evidence with clinical expertise and patient (family) values. (1) During this patient encounter, several issues are raised: What is the differential diagnosis for this problem? Which diagnostic studies would best discover the underlying disorder? What is the natural history of children having a chronic cough? When is antibiotic therapy indicated? These problems can be thought of as knowledge gaps. The first step in the EBM process involves converting these knowledge gaps into answerable questions.

Background questions ask about general knowledge of a certain disorder and are constructed by combining the question root (who, what, where, when, how, why) with the name of the specific disorder or a particular aspect of that disorder. In this case, "a toddler who has mucopurulent nasal discharge" defines the disorder, and the root "what" is added to ask one particular diagnostic background question: "What disease processes do I need to consider in toddlers presenting with nasal congestion?" Over time, the perspective of the pediatrician evolves from that elementary question to, "What are the diagnostic criteria

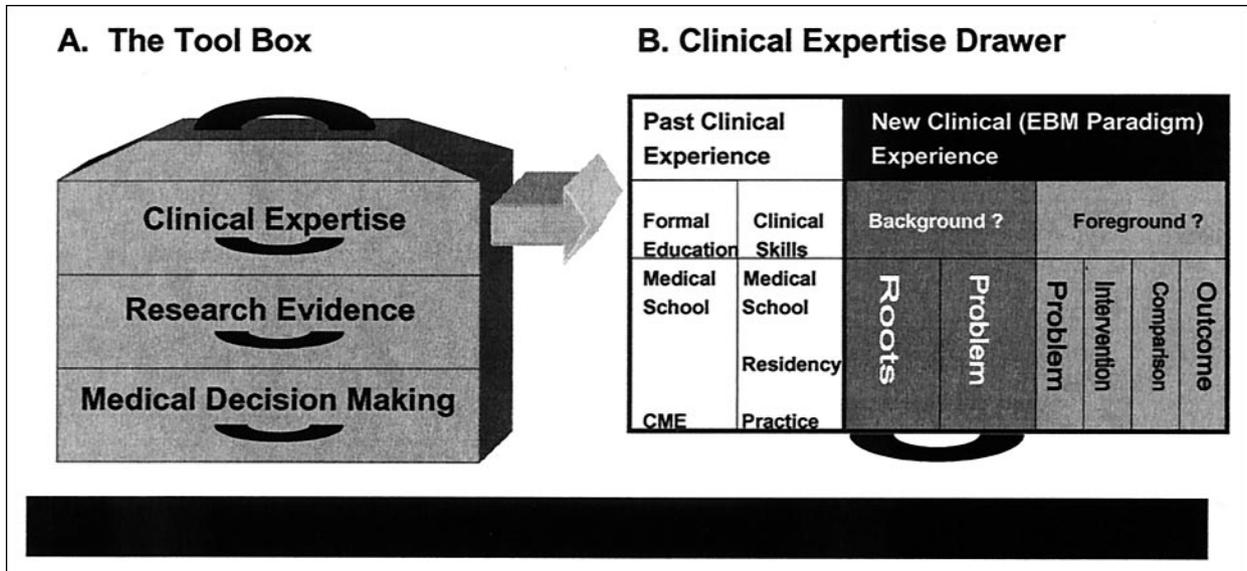*Medicine-Pediatrics Program, Wright State University, Dayton, OH.

A. The Tool Box

Clinical Expertise

Research Evidence

Medical Decision Making

B. Clinical Expertise Drawer

Figure. The evidence-based medicine (EBM) toolbox.

for sinusitis?" and then to the more experienced perspective of, "How helpful is computed tomography (CT) in looking for an infection?" Questions become more refined and specific as the process moves from the background into the foreground.

Foreground questions ask for specific knowledge that will affect patient management. The more focused questions noted previously qualify as foreground questions. When generated with an EBM focus, a foreground question contains several components:

1. The *patient population or condition of interest component* might include gender, age range, or a subgroup of patients having a particular disease.
2. The *intervention or exposure component* includes a form of therapy, a diagnostic test, a risk factor, or a lifestyle.
3. A *comparison*, if applicable, could refer to a placebo, an alternate diagnostic test, or the current standard of care.

4. The *clinical outcome of interest category* might include positive outcomes, such as improvement in health or prevention of illness, or negative health outcomes, such as adverse effects of medications or complications of a procedure.

A poorly formulated question that involves only an intervention and a population is: "Is **CT** useful in the evaluation of **patients who have nasal congestion**?"

A well-formulated question that involves a population, intervention, outcome, and comparison is: "For **toddlers who have sinusitis**, does the use of **CT** scanning provide **sensitive and specific clinical information** that will direct therapy compared with the use of **radiography**?"

It is helpful to be specific with each part of this question-building exercise. The Table illustrates a technique that can be used to help ensure that the question contains these key components. Completing a similar table can help develop a four-component question that is

Table. Answerable Questions Template Tool

Aspect	Patient Problem	Intervention	Comparison	Outcome
Diagnosis	A toddler who has mucopurulent nasal discharge	CT scan	Plain radiography	Power to confirm or exclude bacterial cause
Therapy	A toddler who has nasal discharge	Empiric antibiotics	Placebo	Shortened clinical course
Prognosis	A toddler who has recurrent nasal discharge	Antibiotics	—	Probability of recurrence
Differential Diagnosis	Toddlers who have chronic cough	Thorough diagnostic evaluation	—	Disease probability of specific causes

specific to a patient and relevant to the clinician's knowledge deficit. It is important to remember that nearly every clinical scenario requires asking both background and foreground questions. However, with time and experience, the questions that tend to become most relevant to care decisions are foreground questions.

Questions That Arise Most Often

Most questions that we encounter deal with therapy and diagnosis. Previous reports have estimated that more than 50% of clinicians' questions deal with therapy, and another 25% address diagnosis. In one survey of an ambulatory clerkship, 97% of 216 EBM questions and subsequent reports were in these two domains. (5) In a review of 708 "curbside consultations," 47% were management questions, and an additional 39% were diagnostic questions. (3)

How Often Are Questions Answered?

In a study evaluating family physicians, about 3.2 questions were asked for every 10 patients seen. (6) Older physicians saw more patients and asked fewer questions than younger physicians. Answers to these questions were pursued only one third of the time, with less than 2 minutes devoted to finding each answer. Yet, useful information was found 80% of the time during these attempts. One of the primary barriers identified when physicians seek to answer questions is difficulty with the question format. (7) The question often was vague and open to interpretation. The investigators found it helpful to modify questions to guide their searches better.

What are the benefits in developing a well-formulated question to fill a knowledge gap? The primary goal is to build a question that will serve as a guide for the remainder of the steps in the EBM process. Similar in its value to taking a history, the question frames the clinical problem and focuses the search. Following are six ways in which well-constructed questions make it easier to find the evidence that aids clinicians in making clinical decisions: (8)

- They help define and compare the options for interventions.
- They enable us to think about the patient populations from which evidence can be generalized to an individual patient.
- They define the important outcomes (to the clinician, the patient, or society).
- They identify the most valid study design.
- They allow construction of risk/benefit comparisons that affect medical decisions.

- They structure the search of the research literature.

In the quest for clinical information, physicians initially must be aware of their knowledge gaps. The clinician then can formulate a well-built clinical question and answer it with available resources. The skills necessary to build good questions are easy to learn. A multifaceted intervention shown to improve question building and subsequent searches included the use of a simple question card. (9) A similar study based on this EBM approach found that the well-built clinical question elicited more details, resulting in a more complex and specific search strategy and ultimately improving search precision. (10)

Resources for Answering Background and Foreground Questions

Formulating the answerable question serves an important role in deciding which search method is most useful. With the increasing volume of medical literature, it is paramount to be able to handle information effectively and efficiently. The question formulation process described previously clarifies the specific answers that are needed. For example, background questions will be answered most efficiently with the following resources:

- Classic medical textbooks (eg, *Oski's Pediatrics, Nelson's Textbook of Pediatrics, Hoekelman's Primary Pediatric Care*) or electronically updated texts/CD-ROM (eg, *Scientific American Medicine, Up-to-Date*)
- Narrative review articles (eg, *Pediatrics in Review)*
- Internet resources (eg, eMedicine, Medscape)

Foreground questions typically require more specific and focused answers. User-friendly resources are available that provide relevant, clinically valuable information for managing patient care:

- Primary literature sources such as MEDLINE, Toxline, or other bibliographic databases
- Secondary or "pre-evaluated" references, including those that have explicit criteria (eg, Cochrane collaboration, ACP Journal Club) and those that have less explicit inclusion criteria (eg, guidelines, journal clubs, critically appraised topics)
- Online, searchable access to pediatric journals and national organizations

The utility, advantages, and disadvantages of these various resources are the focus of the next article in this series describing the second step in the EBM process – information searching and retrieval.

Putting it All Together

Returning to the clinical case, a gap in diagnostic knowledge prompted the launching of a quick search to answer the question, "In **toddlers who have sinusitis**, does the use of **CT** scanning provide **sensitive and specific clinical information** that will direct therapy versus the use of **radiography?**"

The key terms were combined into a search query on MEDLINE (the details of which are addressed in the next article in this series). A search using these terms found a systematic review article showing that in infants and toddlers, sinus radiographs are twofold more helpful for diagnosing sinusitis if they are positive and 1.5 times as helpful in excluding sinusitis if they are negative compared with CT scanning. (11)(12) Combining this evidence with our clinical expertise and the family's wishes, we felt justified in ordering a sinus radiograph to initiate the diagnostic evaluation.

In this article, we have outlined an approach to formulating answerable questions, which is the important first step in bringing EBM into a pediatric practice. A simple tool was introduced to help lessen the burden of this step and make the subsequent steps in the EBM process flow smoothly. Approaching clinical problems in this manner employs an explicit and up-to-date clinical decision-making method. Once clinicians are comfortable assembling the clinical question, it is time to begin navigating the research evidence available within the vast sea of medical knowledge. Staying afloat in this sea is the topic of the next article in this series. Search techniques, critical appraisal, evidence application, and evaluation are explained in subsequent articles.

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