1. Asking answerable clinical questions

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As we stated in the Introduction, almost every time we see a patient we will need new information about some element of their diagnosis, prognosis or management. Sometimes what we need will be self-evident and the necessary information will be at our fingertips. At other times our information needs will not be so obvious, and the necessary information will be in the form of external evidence we will have to track down. For many clinicians, the efforts required to both ask questions and track down answers are so formidable that, when coupled with our very limited time for reading and keeping up to date, most of our information needs never get met.

In this book we’ll do our best to provide powerful and efficient ways to fill some of those information needs, and in this chapter we will describe a strategy for formulating answerable clinical questions as the first step in practicing EBM. In our experience, this is the hardest step that many people face in finding best current evidence to address clinical problems. Because EBM begins and ends with patients, we will use a patient encounter to remind us how clinical questions arise and to show how they can be used to initiate evidence-based learning. We will also introduce some teaching tactics that can help us coach others to develop their questioning skills. If you think you already know how to ask answerable questions (although you may want to make sure by trying the example!), skip the early portions of this chapter and go straight to the section on how to teach the asking of answerable clinical questions.
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An example

Suppose you’ve just accepted the invitation of one of your colleagues to join her in-patient clinical team on rounds. The team has finished admitting a patient and they are ready to present to your colleague. The patient is a 77-year-old man admitted for dyspnea and fever. He fell ill 4 days ago with low-grade fever, chills, myalgias, rhinorrhoea and a non-productive cough. One day ago he developed dyspnea on exertion, purulent sputum, lateral chest wall pain with inspiration and a shaking chill. His general health is fairly good; he has had essential hypertension for 12 years, well controlled on diuretic therapy. He has not smoked. He is independent in his activities of daily living. He lives alone now, after his wife died 3 years ago. On examination, his respiratory rate is 28, his heart rate is 108 and his temperature is 39.2°C. He may have subtle cyanosis. His chest expands symmetrically, he has no prolongation of expiration and no wheezing. There is bronchophony and egophony in the left lower posterior lung field. Initial blood tests show leukocytosis and hyponatremia. The team suspects acute community-acquired pneumonia with hypoxemia, and plans chest radiographs, sputum studies, supplemental oxygen and antimicrobial therapy.

Your consultant colleague then asks her team what questions they have about this case: what important pieces of medical knowledge they’d like to have in order to provide better care for this patient. What do you suppose these might be? What questions occur to you about this patient?
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The first three questions asked by the team’s students were:
(a) What microbial organisms can cause community-acquired pneumonia?
(b) How does pneumonia cause egophony?
(c) What do patients mean by calling pneumonia “the old man’s friend”?
What do you make of them?

Types of questions

Notice that the students’ questions (above) ask for general or “background” knowledge about pneumonia, the disorder that presumably explains much of this patient’s acute illness. When well formulated, such “background” questions usually have two components (see Table 1.1):
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Table 1.1 Well-built clinical questions

“Background” questions

- Ask for general knowledge about a disorder
- Have two essential components:
  1. A question root (who, what, where, when, how, why) with a verb
  2. A disorder, or an aspect of a disorder

Examples:

“What causes babesiosis?"
“When do complications of acute pancreatitis usually occur?”

“Foreground” questions

- Ask for specific knowledge about managing patients with a disorder
- Have four (or three) essential components:
  1. Patient and/or problem
  2. Intervention
  3. Comparison intervention (if relevant)
  4. Clinical outcomes

Example:

“In older patients with heart failure from isolated diastolic dysfunction, does adding digoxin to standard diuretic and ACE inhibitor treatment yield enough reduction in morbidity and/or mortality to be worth its adverse effects?”
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1. a question root with a verb (e.g. “what causes…?” or “how does…?”)
2. some aspect of the disorder itself (e.g. cyanosis, hypoxemia).

Note also that “background” questions can cover the full range of biologic, psychological or sociologic aspects of human health and illness.

The team’s house officers asked several questions, too, including:

(a) In patients with suspected pneumonia, are any clinical findings sufficiently powerful to confirm or exclude pneumonia all by themselves, or is a chest radiograph necessary for the diagnosis?

(b) In patients with community-acquired pneumonia, is the probability of *Legionella* infection sufficiently high to warrant considering covering this organism with the initial antibiotic choice?

(c) In patients with community-acquired pneumonia, do clinical features predict outcome well enough that “low risk” patients can be treated safely at home?

Notice that these questions ask for specific knowledge about how to diagnose, “prognose”, and treat patients with pneumonia, which might be called “foreground” knowledge. When well built, such “foreground” questions usually have four components (see Table 1.1):
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1. The patient and/or problem of interest
2. The main intervention (defined very broadly, including an exposure, a diagnostic test, a prognostic factor, a treatment, a patient perception, and so forth)
3. Comparison intervention(s), if relevant
4. The clinical outcome(s) of interest.

Just like “background” questions, “foreground” questions can cover a wide range of biologic, psychological and sociologic aspects of caring for sick persons.

Go back to the three questions you wrote down about our patient. Are they “background” or “foreground” questions? Do your “background” questions specify the two components (root with verb and condition), and do your “foreground” questions contain three or four components (patient/problem, intervention, comparison, and outcome)? If not, try rewriting them to include these components, and consider whether these revised questions are clearer.

As clinicians, we all have needs for both “background” and “foreground” knowledge, in proportions that vary over time and that depend primarily on our experience with the particular disorder at hand (see Fig. 1.1).
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Figure 1.1 Background and foreground questions.
When our experience with the condition is limited, at point “A” (like a beginning student), the majority of our questions (designated in the figure by the vertical dimension) might be about “background” knowledge. As we grow in clinical experience and responsibility, such as at point “B” (like a house officer), we’ll have increasing proportions of questions about the “foreground” of managing patients. Further experience with the condition puts us at point “C”, where most of our questions will be “foreground”. Notice the diagonal line is placed to show that we’re never too green to learn “foreground” knowledge, nor too experienced to outlive the need for “background” knowledge.

Clinical practice demands that we use large amounts of both “background” and “foreground” knowledge. If a clinical situation calls for knowledge that we already possess, we experience the reinforcing mental and emotional responses that have been called “cognitive resonance” and can make rapid decisions. But if our patient’s illness calls for knowledge that we don’t possess, we experience mental and emotional responses termed “cognitive dissonance”, and this can be a powerful motivator. Sometimes it motivates us to develop maladaptive reactions to cognitive dissonance, either by trying to hide our knowledge deficit from ourselves, or by overreacting emotionally with excessive anxiety, guilt or shame. A more positive (“adaptive”) response is to recognize our information needs and use our cognitive dissonance to motivate our learning, by turning the “negative space” of knowledge gaps into the “positive space” of well-built questions and finding answers. (There is an even darker side to not knowing that goes by several names, including ignorance, incompetence, obsolescence, and not knowing when we don’t know. Since we don’t feel any cognitive
dissonance with this, the solution is different: regular review of “current best evidence” through processes and publications that are described in Chapter 2 under “Current Awareness.”

Where and how clinical questions arise

As one might expect, over the years we’ve found that most of our “foreground” questions arise from the central issues involved in caring for patients (see Table 1.2). These groupings are neither jointly exhaustive (other worthwhile questions can be asked), nor mutually exclusive (some questions are “hybrids”, asking about, say, both prognosis and therapy). Still, we find it useful to anticipate that many of our questions will arise from common locations on this “map”: clinical findings, etiology, differential diagnosis, diagnostic tests, prognosis, therapy, prevention, patient experience and meaning, and self-improvement.
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Table 1.2 Central issues in clinical work, where clinical questions often arise

1. **Clinical findings**: how to properly gather and interpret findings from the history and physical examination.

2. **Etiology**: how to identify causes for disease (including its iatrogenic forms).

3. **Clinical manifestations of disease**: knowing how often and when a disease causes its clinical manifestations and how to use this knowledge in classifying our patients’ illnesses.

4. **Differential diagnosis**: when considering the possible causes of our patient’s clinical problem, how to select those that are likely, serious and responsive to treatment.

5. **Diagnostic tests**: how to select and interpret diagnostic tests, in order to confirm or exclude a diagnosis, based on considering their precision, accuracy, acceptability, expense, safety, etc.

6. **Prognosis**: how to estimate our patient’s likely clinical course over time and anticipate likely complications of the disorder.

7. **Therapy**: how to select treatments to offer our patients that do more good than harm and that are worth the efforts and costs of using them.

8. **Prevention**: how to reduce the chance of disease by identifying and modifying risk factors and how to diagnose disease early by screening.

9. **Experience and meaning**: how to empathize with our patients’ situations, appreciate the meaning they find in the experience and understand how this meaning influences their healing.

10. **Self-improvement**: how to keep up to date, improve my clinical and other skills and run a better, more efficient clinical practice.
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Why bother formulating questions clearly? We know of no controlled trials that demonstrate that doing so leads to better evidence, found faster, and used more wisely in patient care. All the authors have are our personal case reports that well-formulated questions have helped us in seven ways:

1. They help us focus our scarce learning time on evidence that is directly relevant to our patients’ clinical needs.
2. They help us focus our scarce learning time on evidence that directly addresses our particular knowledge needs, or those of our learners.
3. They can suggest high-yield search strategies (see Ch. 2).
4. They suggest the forms that useful answers might take (see Chs. 3–6).
5. When sending or receiving a patient in referral, they can help us to communicate clearly with our colleagues.
6. When teaching, they can help our learners to better understand the content of what we teach, while also modeling some adaptive processes for lifelong learning.
7. When we answer our questions, our curiosity is reinforced, our cognitive resonance is restored, and we can become better, faster and happier as clinicians.
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Problems in posing answerable questions

Three problems often impede the posing of answerable questions:

1. *When we’re puzzled by a patient but don’t know where to start.* When we’re stuck but we’re not sure where, we scan Table 1.2 and ask ourselves, for each of the ten clinical issues, whether we have any cognitive dissonance or uncertainty. If we can’t confidently and quickly answer “No!”, we’ve just found a knowledge gap. We can congratulate ourselves for finding it (rather than hiding it or scolding ourselves), and then turn the “negative space” of the gap into the “positive space” of a question.

2. *When we have trouble articulating the question.* When this happens, we can try saying our questions out loud or writing them down with all their components. If we’re stuck, we can use Table 1.2 to locate where we are stuck. Then, we can build our question in two steps, first specifying the central clinical issue and then filling in the components explicitly. For those who are in the habit of writing down clinical questions to answer later, consider dividing the paper into four columns, one for each element of the question, so that questions can be written in quickly as components, rather than as complete sentences.

3. *When we have more questions than time.* This will almost always be the case, so we need to develop a strategy for deciding where to begin. Keep in mind that lifelong learning means learning in many
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small increments over a long time and attempts to do it all at once are impossible and therefore bound to frustrate. Factors to consider when deciding which question to answer first include:

• Which question is most important to the patient’s well-being?
• Which question is most relevant to our learners’ needs?
• Which question is most feasible to answer within the time we have available?
• Which question is most interesting?
• Which question is most likely to recur in our practice?

Questions our patients want answered

Of course, the questions our patients ask may bear little resemblance to our own. How many times have we assured patients with excruciating abdominal pain that they “only have irritable bowel syndrome” when it had not occurred to them that they might have had cancer, yet still have pain? We need to pause a moment, consider our patient’s perspective, and frame a four-part question that will help us assemble the evidence that will help them. This might be initiated by asking them: “What do you think is the problem?”; “Have you any thoughts about what treatment you need/want?”; “What alternatives have you heard about/read about/considered?”; “What benefits do you want/need?”. Incorporating their responses into our
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A four-part question will ensure patient-centered answers that enhance the quality of our consultations and the care we provide.

Often the questions that we and our patients ask relate to their experience of diseases, diagnostic tests and treatments rather than their test results or health outcomes. Research that explores these issues by asking patients about, or by observing, their experiences of diseases, tests and treatments is called “qualitative research”. This type of research seeks to describe and understand patients’ feelings, ideas and wider experience rather than measuring objective outcomes. Whilst we regard the integration of qualitative research to be one of the major current challenges in EBM, we readily admit that we are not expert in this field and defer to others. Much of the work in qualitative research has been undertaken by social scientists and particularly by the nursing profession, whose perspective is often that of the patient and whose objective is to obtain greater understanding of their experience of health care. In doing so, they may employ the methodologies of phenomenology, ethnography, grounded theory, “action research” (in which the researcher is an active participant), and “evaluation research” (in which the researcher passively evaluates participants’ experiences). The emphasis throughout is on experiences rather than “objective” effects, and these may be ascertained through focus groups, individual interviews, surveys, or participant observation. Some qualitative researchers argue that qualitative research results are unique to the subjects of individual studies and are neither generalizable nor combinable through meta-analysis, whilst others believe that generalizable truths can be extracted from individual experiences.
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Teaching the asking of answerable questions

Good questions are the backbone of both practicing and teaching EBM, and patients serve as the starting point for both. Our challenge as teachers is to identify questions that are both patient-based (arising out of the clinical problems of this real patient under the learner’s care) and learner-centered (targeting the learning needs of this learner). As we become more skilled at asking questions ourselves, we also become more skilled in teaching others how to do so.

As with other clinical skills, most of us teach question-asking best by example, i.e. by modeling the formation of good clinical questions in front of our learners. By doing this, we can also model admitting that we don’t know it all, identifying our own knowledge gaps, and showing our learners adaptive ways of responding to the resulting cognitive dissonance. Once we’ve modeled asking a few questions, we can stop and describe explicitly what we did, noting each of the elements of good questions, whether “background” or “foreground”.

The four main steps in teaching clinical learners how to ask good questions are listed in Table 1.3.
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Table 1.3 Key steps in teaching how to ask questions for EBM

1. **Recognize:** how to identify combinations of a patient’s needs and a learner’s needs that represent opportunities for the learner to build good questions and hone question-asking skills.

2. **Select:** how to select from the recognized opportunities the one (or few) that best fits the needs of the patient and the learner at that clinical moment.

3. **Guide:** how to guide the learner in transforming knowledge gaps into well-built clinical questions.

4. **Assess:** how to assess the learner’s performance and skill at asking pertinent, answerable clinical questions for practicing EBM.
If we are to recognize potential questions in learners’ cases, help them select the “best” question to focus on, guide them in building that question well, and assess their question-building performance and skill, we need to be proficient at building questions ourselves. Moreover, we need several attributes of good clinical teaching in general, such as good listening skills, enthusiasm and a willingness to help learners develop to their full potential. It helps to be able to spot signs of our learners’ cognitive dissonance, to know when and what they’re ready to learn.

Note that teaching question-asking skills can be integrated with any other clinical teaching, right at the bedside or other site of patient care, and it needn’t take much additional time. In fact, it’ll save learning time in the long run, for our learners will become much more efficient in asking answerable questions, leaving more time for actually learning their answers.

Once we have formulated an important question, how might we keep track of it and follow its progress toward a clinically useful answer? It may be just one of several questions we formulate during a single encounter and it may not be answered for days. One tactic we’ve used for keeping track, the educational prescription shown in Figure 1.2, helps both teachers and learners in five ways:

1. It specifies the clinical problem that generated the question.
2. It states the question, in all of its key elements.
3. It specifies who is responsible for answering it.
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4. It reminds everyone of the deadline for answering it (taking into account the urgency of the clinical problem that generated it).

5. Finally, it reminds everyone of the steps of searching, critically appraising and relating the answer back to the patient.

**Figure 1.2** An educational prescription.

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**Educational Prescription**

Patient’s Name  
Learner:

**3-part Clinical Question**

Target Disorder:

Intervention (+/- comparison):

Outcome:

Date and place to be filled:

Presentations will cover:
1. search strategy;
2. search results;
3. the validity of this evidence;
4. the importance of this valid evidence;
5. can this valid, important evidence be applied to your patient;
6. your evaluation of this process.
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How might we use the educational prescription in clinical teaching? The number of ways is limited only by our imaginations and our opportunities for teaching. As we’ll reinforce in Chapter 8 (Teaching methods), educational prescriptions have been incorporated into familiar in-patient teaching settings from work rounds and attending/consultant rounds to morning reports and noon conferences. They have also been used in out-patient teaching settings, such as ambulatory morning report. Some general practitioners we know write them on real prescription blanks and toss them in a tray that they and their colleagues review periodically, taking the recurring themes up as a shared activity throughout the partnership.

Will you and your learners follow through on the educational prescriptions? You might, if you build the writing and “dispensing” of them into your everyday routine. One tactic we use is to make specifying clinical questions an integral part of presenting a new patient to the group. For example, we ask learners on our general medicine in-patient clinical teams, when presenting new patients, to tell us “33 things in 3 minutes” about each admission. As shown in Table 1.4, the final element of their presentations is the specification of an important question to which they need to know the answer and don’t. If the answer is vital to the immediate care of the patient, it can be provided at once by another member of the clinical team, perhaps by referring to the record (such as a one-page “CAT”)* of the answer generated from posing that same question on an earlier occasion. Most of the time the answer can wait a few hours or days, so the question can serve as the start of an educational prescription.

* CATs (“critically appraised topics”) are described in detail on p. 87.
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Table 1.4 A patient presentation that includes an educational prescription

1. The patient’s surname.
2. The patient’s age.
3. The patient’s gender.
4. When the patient was admitted.
5. The chief complaint(s) that led to admission. For each complaint, mention the following:
6. Where in the body it is located.
7. Its quality.
8. Its quantity, intensity and degree of impairment.
10. Its setting: under what circumstances did/does it occur.
11. Any aggravating or alleviating factors.
13. Whether a similar complaint had happened previously. If so:
14. How it was investigated.
15. What the patient was told about its cause.
16. How the patient had been treated for it.
17. Pertinent past history of other conditions that are either of prognostic significance or would affect the evaluation or treatment of the chief complaint.
18. And how those other conditions have been treated.
19. Family history, if pertinent to chief complaint or hospital care.
20. Social history, if pertinent to chief complaint or hospital care.
21. Their:
   (a) Ideas (what they think is wrong with them)
   (b) Concerns (about their illness, and other issues)
   (c) Expectations (of what’s going to happen to and for them).
22. Their condition on admission:
   (a) acutely and/or chronically ill
   (b) severity
   (c) requesting what sort of help.
23. The pertinent physical findings on admission.
24. The pertinent diagnostic test results.
25. Your concise, one-sentence problem synthesis.
26. What you think the most likely diagnosis is.
27. And the other items in your differential diagnosis.
28. Any further diagnostic studies you plan to carry out.
29. Your estimate of the patient’s prognosis.
30. Your treatment plans.
31. How you will monitor the treatment.
32. And what you will do if the patient doesn’t respond to the treatment.
33. The educational prescription you would like to write for yourself in order to better understand the patient’s disorder (“background” knowledge) or how to care for the patient (“foreground” knowledge) in order to become a better clinician.
Finally, we can ask our learners to write educational prescriptions for us. This role reversal can help in four ways:

1. the learners must supervise our question building, thereby honing their skills further
2. the learners see us admitting our own knowledge gaps and practicing what we preach
3. it adds fun to rounds and sustains group morale
4. our learners begin to prepare for their later roles as clinical teachers.

That concludes this chapter on the first step in practicing and teaching EBM: asking answerable clinical questions. Since you and your learners will want to move quickly from asking questions to finding their answers, our next chapter will address this second step in practicing and teaching EBM.

Further reading


Richardson W S. Ask, and ye shall retrieve [EBM Note]. Evidence-Based Medicine 1998; 3: 100–1.
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