Good Question!
Knowing what to ask

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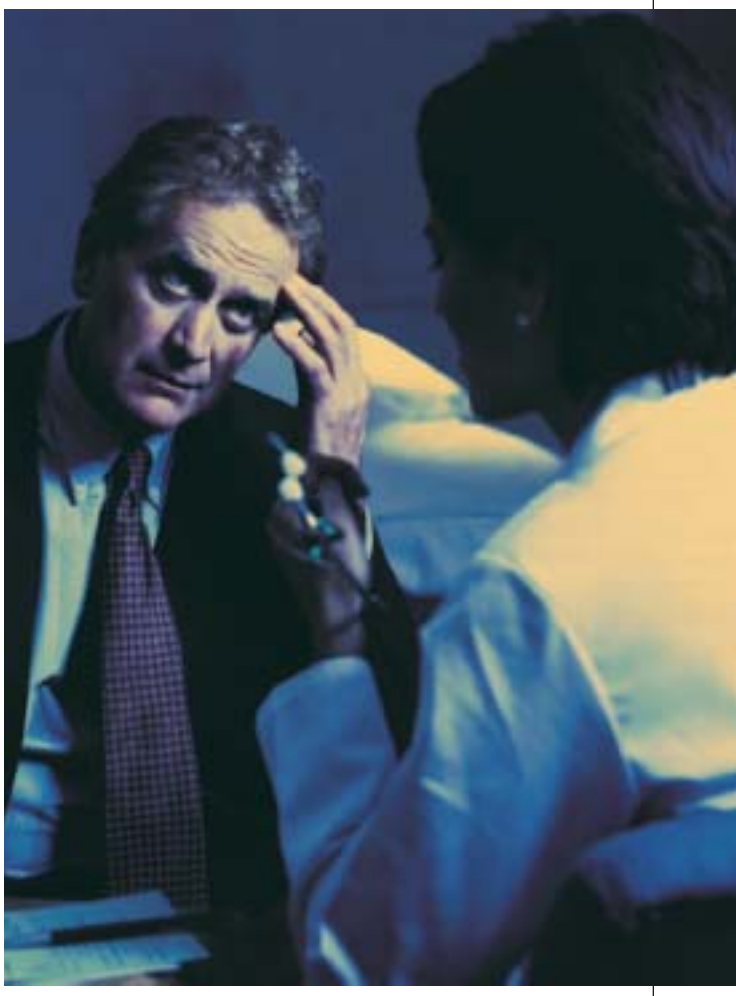

Among a variety of challenges in the practice of evidence-based medicine is the posing of good questions.[1] Although some questions come from talking with colleagues and students, reading medical literature, or attending continuing medical education (CME) events, most questions derive from caring for patients. Consider the following case study and the questions that arise.

A visit such as the one presented in the case study on the next page may generate many questions, which can be classified by type. Most clinical questions focus on therapy, differential diagnosis and diagnostic tests, but some are about prognosis, prevention and etiology (Table 1).[2]

Good Question!

Case Study

A 25-year-old woman, G2P1 at 25 weeks gestation, comes to your office complaining of uncomfortable leg swelling. Her one-hour glucose challenge test is 14 mmol/L. During her first pregnancy, she had a postpartum pulmonary embolism diagnosed by computed tomography (CT) angiogram and was treated with six months of warfarin. Her only current medication is folate. On physical examination, her blood pressure is 120/80 mmHg and weight is 70 kg. She has bilateral leg edema. Urinalysis shows 1+ proteinuria. She fears injections.

What questions arise?

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What Is A Good Question & How Should I Pose It?

A good question is one that is relevant to a clinical problem and formulated so as to obtain an answer more easily.[3] The key to posing answerable questions is to formulate them carefully.

The mnemonic POSIT may be helpful. First, describe the ***P*atient *P*opulation** and ***P*roblem**. The patient's age and sex may define the patient population, while the patient's condition, clinical features and working diagnosis outline the problem.

Second, determine the ***O*bservations** and/or ***O*utcomes** of interest. For questions about diagnosis, you need to name the reference standard. For questions about therapy or prognosis, you want hard clinical outcomes (*e.g.*, morbidity and mortality), but may have to settle on a surrogate outcome (*e.g.*, glucose control). For questions about etiology, you will need to consider an outcome (*e.g.*, pulmonary embolism) and observation (*e.g.*, thrombophilic risk factor).

Third, consider the ***S*etting**. Is the patient presenting in the clinic, emergency room or hospital?

Fourth, describe the ***I*ntervention** or ***I*nvestigation**. Is the intervention a therapy or a test? For drug therapy, you can name the drug (*e.g.*, glyburide), or specify the class of drug (*e.g.*, sulfonylureas). For tests, specify whether the test is for screening or for confirmation of a diagnosis.

Finally, decide on the ***T*ype** of study question. By specifying the type of question, you can choose the appropriate design of a study giving high-quality evidence. For a question about the diagnosis, you want a comparison between a test and a gold standard. For a question about the differential diagnosis or prognosis, you want a cohort study. For a question about therapy, you want a randomized controlled

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trial or systematic review. For a question about etiology, you want a prospective cohort or a case-control study.

From the POSIT mnemonic, you can "POSIT" the title of a study that would answer your question. See Table 2 for some formulated questions and posited study titles centered on the case study described above.

How Should I Manage Questions In The Clinic?

As you work in the clinic, record questions on charts or on clinic flow sheets. Urgent questions can be answered in the clinic, *via* the Internet, or when doing your paperwork. When back in your office, you can prioritize less urgent questions. Flag charts as active or keep them on your desk while you are waiting for some free moments to do computer searching, and file less urgent questions in a binder. The "educational prescription" has been used to manage questions for medical education.[4] This is a note that records the formulated question, the learner's name and the learning tasks. To fill the prescription, the learner details the search, critically appraises the results and describes their impact on patient management. Other strategies for handling questions include giving them as a challenge to a consultant, peer or student. You can save some questions to "stump the speaker" at upcoming CME events, or submit them to "ask the experts" columns in journals or on Web sites.

How Can I Prioritize Questions?

Because so many questions arise during clinical practice, you need to prioritize them. First, choose questions about frequent problems with important consequences. Next choose questions about less frequent problems if they are serious or life-threatening, or questions about minor problems if they

Table 1

Some Questions to Ask

- **Diagnosis:** How good is the glucose tolerance test? How good is the CT angiogram for pulmonary embolism?
- **Differential diagnosis:** What are the causes of edema?
- **Therapy:** What anti-thrombotic management is needed? Do oral agents work for gestational diabetes? Are diuretics safe in pregnancy?
- **Prognosis:** What is the risk of recurrent pulmonary embolism?
- **Prevention:** What is the benefit of folate?
- **Etiology:** What are the risk factors for pulmonary embolism?

Table 2

Questions and "POSIT"

Question	Patient & Problem	Observation(s) &/or Outcomes	Setting	Intervention(s) or Investigation	Type of Study	Study Title Posit
What anti-thombotic management is needed?	Pregnant women.	Thromboembolism.	Outpatient.	LMW heparin.	Therapy: RCT.	RCT of LMW heparin in pregnant women with previous thromboembolism.
What is the risk of recurrent pulmonary embolism?	Pregnant women.	Thromboembolism.	Outpatient.	Surveillance.	Prognosis: Prospective cohort.	Prospective cohort of pregnant women with previous thromboembolism: Risk of recurrence.
What are the risk factors for pulmonary embolism?	Pregnant women.	Pulmonary embolism.	Outpatient.	Surveillance.	Etiology: Case-control study.	Risk factors for pulmonary embolism in pregnancy.
How good is the glucose challenge for diabetes?	Pregnant women.	Fetal macrosomia.	Outpatient.	1 hr glucose challenge test in mid-trimester screening.	Diagnosis: Comparison with gold standard, accuracy.	Accuracy of the1 hr glucose tolerance text for the screening diagnosis of gestational diabetes & fetal macrosomia.
What are causes of edema?	Pregnant women. Edema.	Edema.	Outpatient.	Surveillance.	Differential diagnosis: Prospective cohort.	A prospective case series of pregnant women with edema.
Do oral agents work for gestational diabetes?	Pregnant women. Hyperglycemia.	Fetal and neonatal outcomes. Glucose control.	Outpatient.	Glyburide *versus* insulin.	Therapy: RCT.	RCT of glyburide *versus* insulin for gestational diabetes.
What is benefit of folate?	Pregnant women.	Neural tube defects.	Outpatient.	Folate.	Prevention: RCT or prospective cohort.	Controlled trial of folate for prevention of neural tube defects.

LMW = Low molecular weight; RCT = Random controlled trial

are frequent. With constrained resources for health care, you might also ask questions about inexpensive tests (*e.g.*, urinalysis) or treatments (*e.g.*, antihypertensive medication) used frequently. Alternatively, you might ask questions about expensive tests (*e.g.*, CT angiography) or treatments (*e.g.*, vena caval filters for thromboembolism), even if used infrequently. Occasionally, choose a question simply because it is of keen interest to you.

How Do I Search For Answers?

The goal is to find some, but not too many, relevant articles that contain high-quality evidence.[5] If a search retrieves too many articles, try to refine the question to decrease the number. For example, for a question about therapy for gestational diabetes, you may wish to start with randomized controlled trials. If there are many randomized controlled trials, specify a systematic review. If there are no randomized controlled trials, you may have to settle for a controlled trial. Search filters can improve efficiency of retrieving articles. See the National Center for Biotechnology Information (NCBI) Pub Med Web site at *www.ncbi.nlm.nih.gov/entrez/query/static/clinical.html*.

What Can I Do With Answered Questions?

Putting a copy of the retrieved, published evidence on the patient's chart or attaching it to a consultation note may be useful to document how you reached your management decisions. In addition to supporting your patient's evidence-based management, answered questions can become personal learning projects,[6] which are elements of maintenance competence programs (Pearls of MAINPRO-C for the College of Family Physicians of Canada and PLPs of MOCOMP for the Royal College of Physicians and Surgeons of Canada).[7] You may get credit for answering these questions by:

- Formulating the question;
- Recording the stimulus for the learning;
- Searching and critically appraising the literature; and
- Assessing the effect of results of your search on your clinical practice.

The critically appraised topic (CAT) summarizes evidence found during a search to answer a question.[8]

Case Discussion

After seeing this patient, you prioritize some of your many questions (Table 2). Because venous thromboembolism is potentially life-threatening, you send her for Doppler studies of the legs and wonder about low molecular weight heparin prophylaxis.

While awaiting her return, you POSIT that there may be published articles to help you answer your questions. You ask, "Do pregnant women with previous thromboembolism (***P***atient & problem) have less risk of recurrence (***O***utcome) with outpatient (***S***etting) low molecular weight heparin (***I***ntervention) based on a randomized controlled trial (***T***ype of article)?" You find no such article.

You decide to reformulate the question and ask, "In pregnant women with previous thromboembolism (***P***), what is the risk of recurrence (***O***) during outpatient (***S***) surveillance (***I***) based on a prospective cohort study (***T***)?" You find a report by Brill-Edwards *et al* suggesting that pregnant women with a single episode of thromboembolism and no thrombophilic risk factors have a low risk of recurrence if left untreated antepartum, but anticoagulated postpartum.[9]

Then you ask, "In pregnant patients (***P***), what are the risk factors for venous thromboembolism (***O***) found during outpatient (***S***) surveillance (***I***) based on prospective cohort or case-control studies (***T***)?" You find several articles about thrombophilic risk factors. You decide to refer your patient to the hematology clinic to check for these.[10-12]

Later, while doing your paperwork, you consider her gestational diabetes. You ask, "In the midtrimester of pregnancy (***P***) can subsequent fetal macrosomia (***O***) be predicted by the outpatient (***S***) glucose challenge test (***I***) as a screening diagnosis (***T***)?" You find a large study comparing the glucose

challenge test to the surrogate gold standard (the oral glucose tolerance test) and fetal outcomes.[13]

Because of your patient's reluctance to take injections, you ask, "Do pregnant women with gestational diabetes (***P***) have similar rates of maternal glycemic control and fetal macrosomia (***O***) with outpatient (***S***) oral hypoglycemic agents versus insulin injections (***I***) based on randomized controlled trial evidence (***T***)?" You find a randomized controlled trial suggesting that glucose control is similar for glyburide and intensive insulin therapy, however, maternal and fetal outcomes are secondary endpoints.[14] You mention this article in your consultation request letter to the gestational diabetes clinic.

Conclusion

The practice of evidence-based medicine is the process of self-directed learning through identifying knowledge gaps, formulating questions, searching for relevant articles, critically appraising these articles for the best evidence and making management decisions.[15] Overconfidence, discomfort with knowledge gaps and an inability to prioritize questions can be barriers to asking good questions. Asking unanswerable questions is frustrating. Posing good questions is the key to efficient computer-based searching and evidence-based medical practice.[16] CME

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