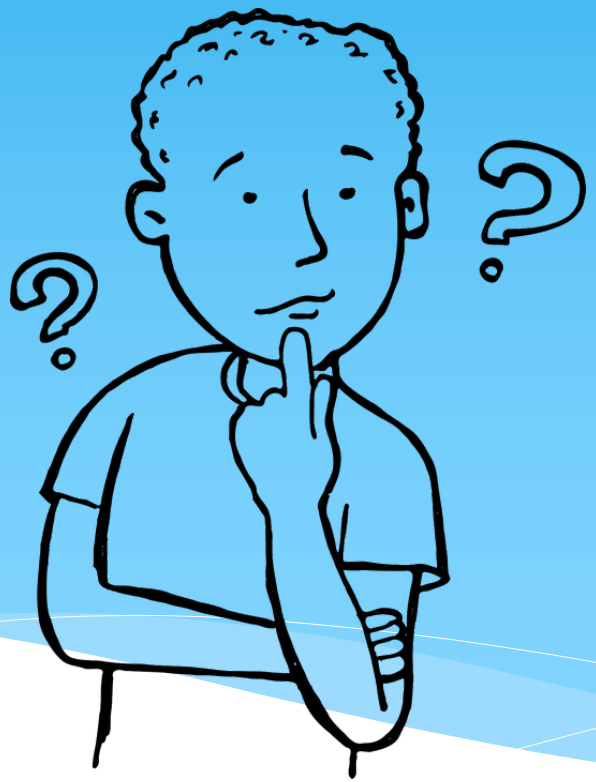
Asking Answerable Clinical Questions



Zekeriya Aktürk
zekeriya.akturk@gmail.com

https://pixabay.com/vectors/thinker-thinking-person-idea-28741/

Objectives

* This presentation aims to introduce methods of asking clinical questions that are answerable with evidence from clinical care research.
* At the end of this session, the participants are expected to;
  * Distinguish between background & foreground questions
  * Explain the components of a well-built (foreground) clinical question
  * Explain strategies for practicing EBM

A case

* 36-year-old woman has episodes of chest discomfort and fatigue with exertion over the last several months. No prior health conditions.
* Examination: central cyanosis; pronounced clubbing of all fingers and toes; late systolic heave of right sternum; a loud, widely split S2; and a grade III/VI midsystolic murmur over the pulmonic area.
* Tests: elevated blood hemoglobin and decreased oxygen partial pressure and saturation.
* Echocardiography: 7-mm secundum defect in the interatrial septum, with enlarged right atrium and ventricle, and signs of severe pulmonary hypertension and right-to-left shunting.

Which questions would you ask?

* What kind of medical knowledge would you like to have to provide better care for this patient?

Students

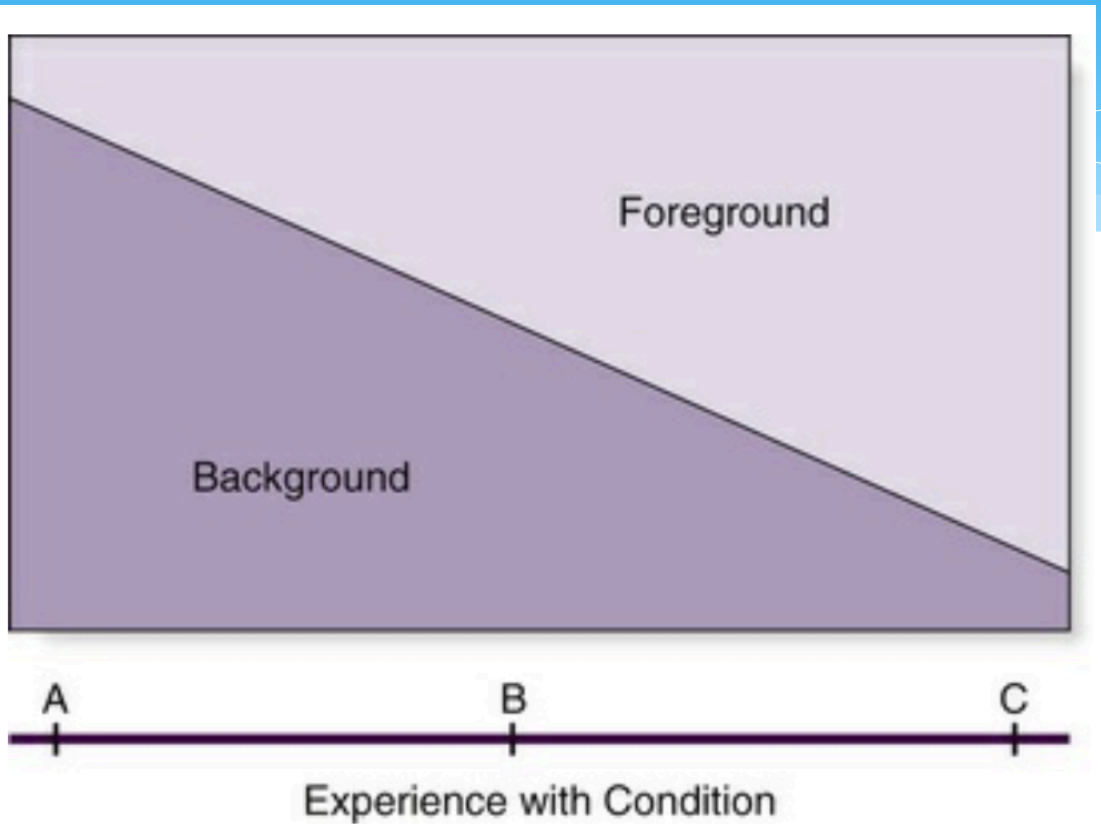
* What normal developmental process has gone awry to cause this patient's septal defect?
* How does cyanosis develop in patients with hypoxemia?
* What is clubbing, and what are its possible causes?

Doctors

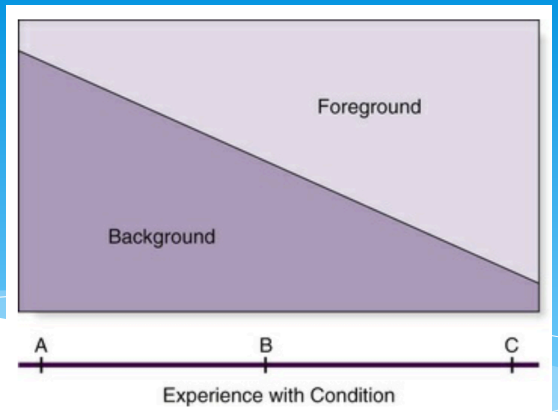
* Among adults found to have atrial septal defect, does the presence of the right-to-left shunt and Eisenmenger syndrome indicate a worse prognosis, compared with patients in whom this has not occurred?
* For adults with atrial septal defect complicated by Eisenmenger syndrome, is surgical repair of the septal defect associated with enough improvement in symptoms, health-related quality of life, disease measures, or mortality to be worth its potential harmful effects and costs?

Background and foreground questions

* Students usually ask questions concerning general knowledge.
* any disorder or health state, a test, a treatment or intervention, or other aspect of health care
* can encompass biological, psychological, or sociologic phenomena
* These are called “background” questions



Straus, Sharon E., et al. Evidence-Based Medicine E-Book: How to Practice and Teach EBM. Elsevier Health Sciences, 2018



* We all need both background and foreground knowledge, in proportions varying over time and depending on our experience with the disorder.
* When our experience with the condition is limited, (e.g. a student), the majority of our questions might be about background knowledge.
* As we grow in clinical experience and responsibility, (e.g. a house officer), the proportions of questions about of managing patients will increase.
* Further experience with the condition puts us at point "C" (like a consultant), where most of our questions will be foreground questions.
* We are never too green to learn foreground knowledge, nor too experienced to outlive the need for background knowledge.

Background questions

* Background questions have two components

1. A question root (who, what, where, when, how, why) and a verb.
2. A disorder, test, treatment, or other aspect of health care.

Example

* “How does heart failure cause pleural effusion?”
* “What causes swine flu?”

Foreground questions

* Have four essential components:

1. P: Patient, population, predicament, or problem.
2. I(E): Intervention, exposure, test, or other agent.
3. C: Comparison intervention, exposure, test, and so on, if relevant.
4. O: Outcomes of clinical importance, including time, when relevant.

Extension of PICO: PICO-TT

* P
* I
* C
* O
* T- Type of question
* T- Type of article/citation

Type of Question/Article

* Therapy- RCT or Meta-Analysis
* Diagnosis- RCT, possibly Meta-Analysis
* Prognosis- Cohort, possibly Meta-Analysis
* Harm- Case/Control, Cohort, possibly RCT or Meta-Analysis

* In patients with severe aortic stenosis without symptoms, which prognostic indicators are helpful in determining the timing of aortic valve replacement?

* P: In a patient w/ dementia of unknown etiology
* I: Does the use of cholinesterase inhibitors
* C: Compared with placebo or no treatment
* O: Result in clinical improvement for the patient?

* P: In patients with acquired brain injury
* I: do the nonpharmacological interventions cited in the literature (elevating the head of the bed, body rotation, hyperventilation, hypothermia, hyperbaric oxygen, CSF drainage, craniotomy/craniectomy)
* C: compared to one another
* O: are superior at decreasing ICP and improving survival?

* P - In women with history of atopic dermatitis
* I - who breastfeed their babies
* C – compared to those who formula feed
* O – is the risk of developing atopic dermatitis in their newborns lower?

* Does adolescent BMI have a correlation with adult coronary artery disease or atherosclerosis?

* P: In patients with fibromyalgia,
* I: does treatment with opioids compared to
* C: treatment with non-opioid analgesics or placebo
* O: result in a reduction of chronic pain?

* P: In children with acute abdominal pain,
* I: is transabdominal ultrasound
* C: compared to CT imaging
* O: more sensitive and specific for diagnosing acute appendicitis?

* In adults with heart failure and reduced systolic function, would adding the implantation of an electronic resynchronization device to standard therapy reduce morbidity or mortality enough over 3 to 5 years to be worth the potential additional harmful effects and costs?

Are mass media interventions effective in preventing smoking in young people?

Problem, population	Intervention	Comparison	Outcome	Types of studies
Young people, under 25 years of age	1. Television 2. Radio 3. Newspapers 4. Billboards 5. Posters 6. Leaflets 7. Booklets	No intervention	1. objective measures of smoking 2. self-reported smoking behaviour 3. Intermediate measures (intentions, attitudes, knowledge) 4. Process measures (eg. media reach)	1. RCT (and quasi-RCT) 2. Controlled before and after studies 3. Time series designs

http://ph.cochrane.org/sites/ph.cochrane.org/files/public/uploads/Unit_Five.pdf

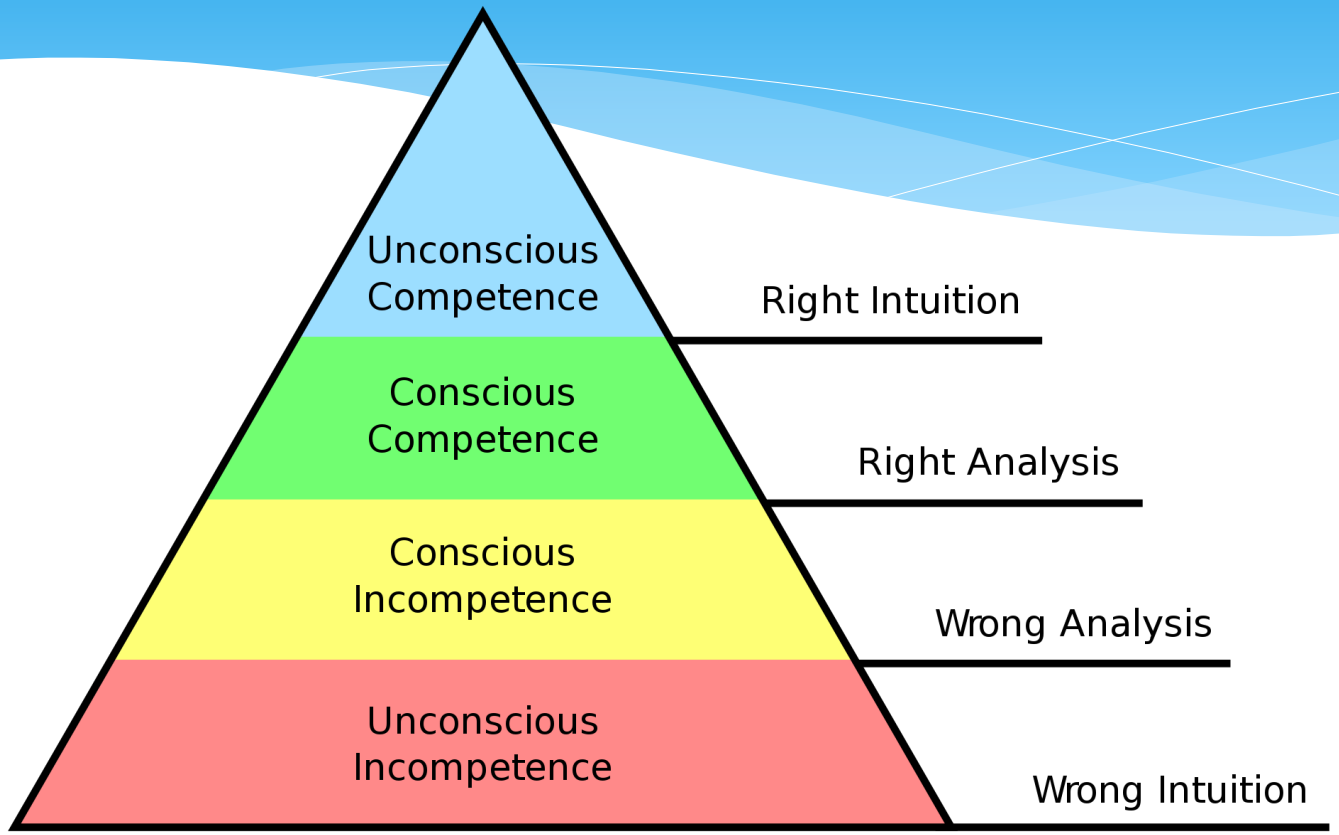
Components of a foreground question

* The patient situation, population, or problem of interest.
* The main intervention, defined very broadly, including an exposure, a diagnostic test, a prognostic factor, a treatment, a patient perception, and so forth
* A comparison intervention or exposure (also defined very broadly), if relevant.
* The clinical outcome(s) of interest, including a time horizon, if relevant.

Which type of questions did you ask?

* Foreground or background?
* Do your questions have two components or four components?
* Try rewriting and improving your questions.

Four stages of competence



Hierarchy of Competence

https://en.wikipedia.org/wiki/Four_stages_of_competence

Cognitive dissonance and resonance

* Our patient's condition may call for knowledge we know we already possess, so we will experience the reinforcing mental and emotional responses termed "**cognitive resonance**" as we apply the knowledge in clinical decisions.
* We may realize that our patient's illness calls for knowledge we don't possess, and this awareness brings the mental and emotional responses termed "cognitive dissonance" as we confront what we don't know but need.

* When teachers ask questions to which you know the answers, do you raise your hand to give the answers?
* When teachers ask questions to which you don't know the answers, do you raise your hand and say, “I don't know this, but I can see how useful it would be to know, and I'm ready to learn it today”?
* Although in the short run, hiding our ignorance in the classroom may prove useful, in the long run, it becomes maladaptive in clinical practice if we continue to try to hide our knowledge gaps from ourselves and avoid learning, because it will be our patients who will pay the price.

* **Cognitive dissonance** (we know that we don't know) can become powerful motivators for learning, if handled well, such as by celebrating the finding of knowledge needs and by turning the "negative space" of knowledge gaps into the "positive space" of well-built clinical questions and learning how to find the answers.
* Unfortunately, if handled less well, our cognitive dissonance might lead us to less adaptive behaviors, such as trying to hide our deficits, or by reacting with anger, fear, or shame.

* By developing awareness of our knowing and thinking,
  * we can recognize our cognitive dissonance when it occurs,
  * recognize when the knowledge we need would come from clinical care research,
  * and articulate the background or foreground questions to find the answers.

Sources of clinical questions

* 1. **Clinical findings**: how to properly gather and interpret findings from the history and physical examination.
* 2. **Etiology/risk**: how to identify causes or risk factors for disease (including iatrogenic harms).
* 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 problems, how to select those that are likely, serious, and responsive to treatment.

* 5. **Diagnostic tests**: how to select and interpret diagnostic tests, to confirm or exclude a diagnosis, based on considering their precision, accuracy, acceptability, safety, expense, and so on.
* 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. **Improvement:** how to keep up to date, improve our clinical and other skills, and run a better, more efficient clinical care system.

* Many of our knowledge needs occur around, or during, our clinical encounters with patients.
* “What is the matter?”
  * relates to questions about diagnosis that are in our minds.
* “What will this mean for me?”
  * prognosis, and experience
* “What should be done?”
  * treatment and prevention

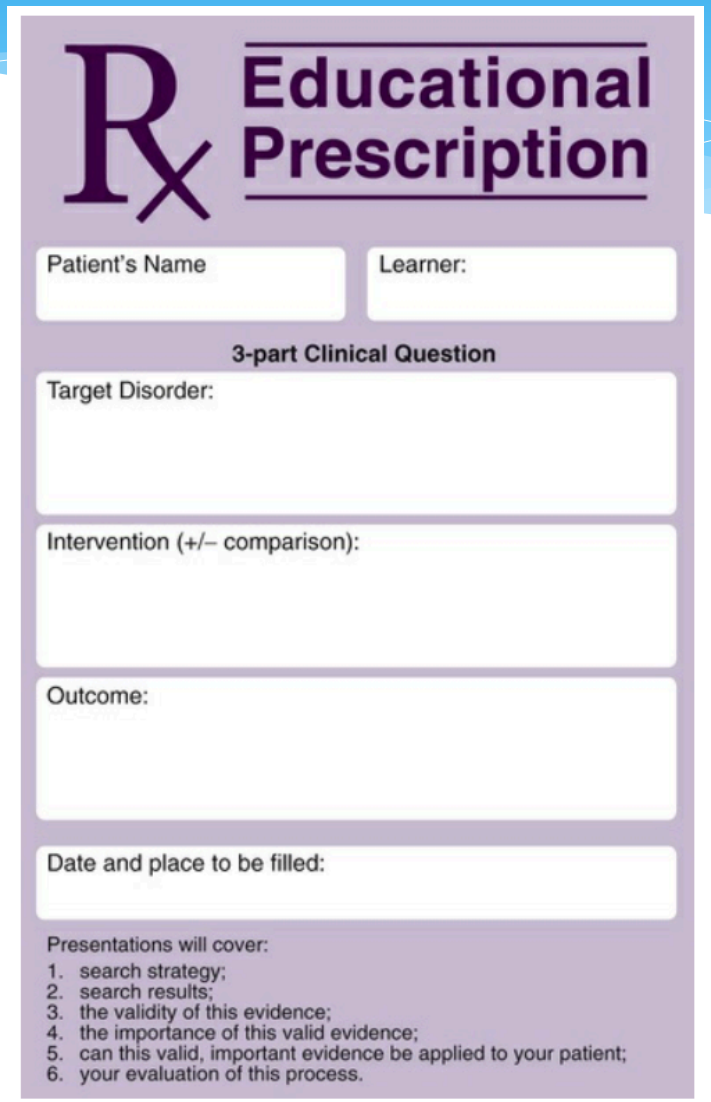
Practicing EBM in real time

* Usually we have many more questions than time to answer them.
* Therefore, you should have a strategy in answering your EBM questions:
  * capturing or saving,
  * scheduling,
  * selecting

Capturing EBM questions

* It will take mostly 15 seconds to record your question.
  * 1. Taking brief notes on a blank page with columns, labelled PICO
  * 2. Keying brief notes into an electronic file on a PC.
  * 3. Writing questions onto actual prescription blanks.
  * 4. Jotting shorthand notes onto blank cards kept in your pocket.
  * 5. Using a smartphone app and writing or dictating.
  * 6. Learning portfolio

Prescribe yourself an education



Rx 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.

Scheduling

* We have to decide by when we need to have our questions answered,
* Integrated clinical care and information systems may improve to the point where our questions will be answerable at the time they arise. However, mostly this is not yet the case, and we need to be realistic in planning our time.
* First things first!
* You must decide on the few questions that demand immediate answers from the majority that can be scheduled to be answered later that day or at the next scheduled appointment.

Selecting: Which question to ask?

* Which question is most important to the patient's well-being?
* Which question is most relevant to your/your patients' knowledge needs?
* Which question is most feasible to answer within the time you have available?
* Which question is most interesting to you or your patient?
* Which question is most likely to recur in your practice?

Why formulating questions?

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.
4. They suggest the forms that useful answers might take.

7. When sending or receiving a patient in referral, they can help us communicate more clearly with our colleagues.
8. When teaching, they can help our learners to better understand the content of what we teach while also modelling some adaptive processes for lifelong learning.
9. When our questions get answered, our knowledge grows, our curiosity is reinforced, our cognitive resonance is restored, and we can become better, faster, and happier clinicians.

Summary

* What are background and foreground questions?
* Please explain cognitive resonance, cognitive dissonance and their relationship with EBM.
* Explain the components of a well-built foreground clinical question.
* What are the three strategies for practicing EBM?