جامعة الملك سعود
King Saud University

Introduction to Evidence-Based Medicine

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Objectives

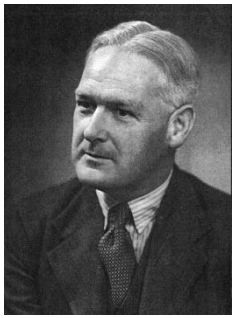
- Identify the principles of evidence based health practice
- Justify why EBM is important with historical background
- Explain how to practice EBM by 5 steps approach
- Explain Step 1- PICO formulation
- Explain benefits of asking focused questions

HISTORY

- They name was consolidated as EBM in 1992 by a group led by Gordon Guyatt at McMaster University in Canada.
- Since then, the number of articles about evidence-based practice has grown exponentially (from 1 publication in 1992 to about a thousand in 1998) and international interest has led to the development of 6 evidence-based journals (published in up to 6 languages) that summarize the most relevant studies for clinical practice and have a combined world-wide circulation of over 175,000.

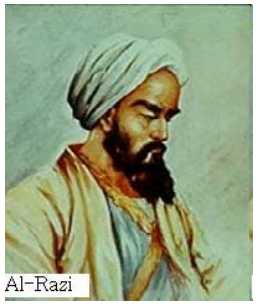
Some milestones in the history of EBM

James Lind
publishes review & clinical trial in *Treatise on Scurvy*



Bradford-Hill
publishes *Principles of Medical Statistics* &
MRC trial of streptomycin

900 AD 1780 1840 1937/48 1967 1970's



Al-Rhazi

For I once saved one group by it, while I intentionally neglected another group. By doing that, I wished to reach a conclusion .

Pierre Louis
Develops his "numerical method" and changes blood letting practice in France

Alvan Feinstein
publishes his book *Clinical Judgement*

IMPORTANCE

1. There is daily need for valid information about diagnosis, prognosis, therapy and prevention

2. The inadequacy of traditional sources for this information because they are out-of-date:
    1. Textbooks,
    2. frequently wrong experts,
    3. ineffective didactic continuing medical education
    4. too variable medical journals in their validity for practical clinical use.

IMPORTANCE

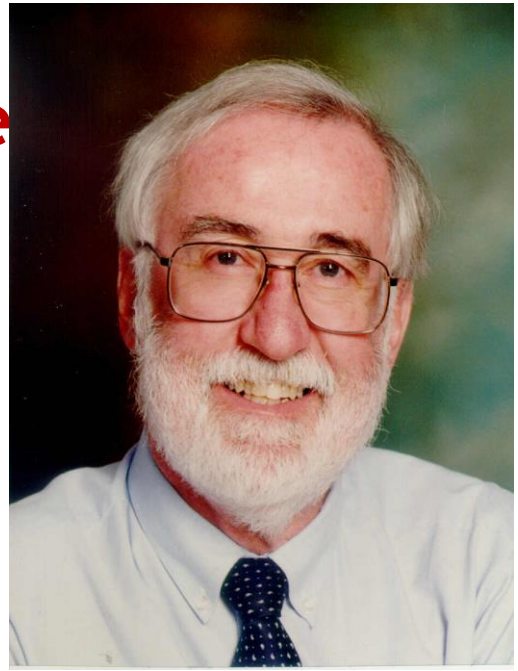
3. The disparity between our diagnostic skills and clinical judgment, which increase with experience, and our up-to-date knowledge and clinical performance, which decline.

4. Our inability to afford more than a few seconds per patient for finding and assimilating this evidence, or to set aside more than half an hour per week for general reading and study.

Uses of "EBM"

- Use of empirically-verified treatments in the care of patients
- Incorporation of research results into the process of care
- Ability to critically appraise research results

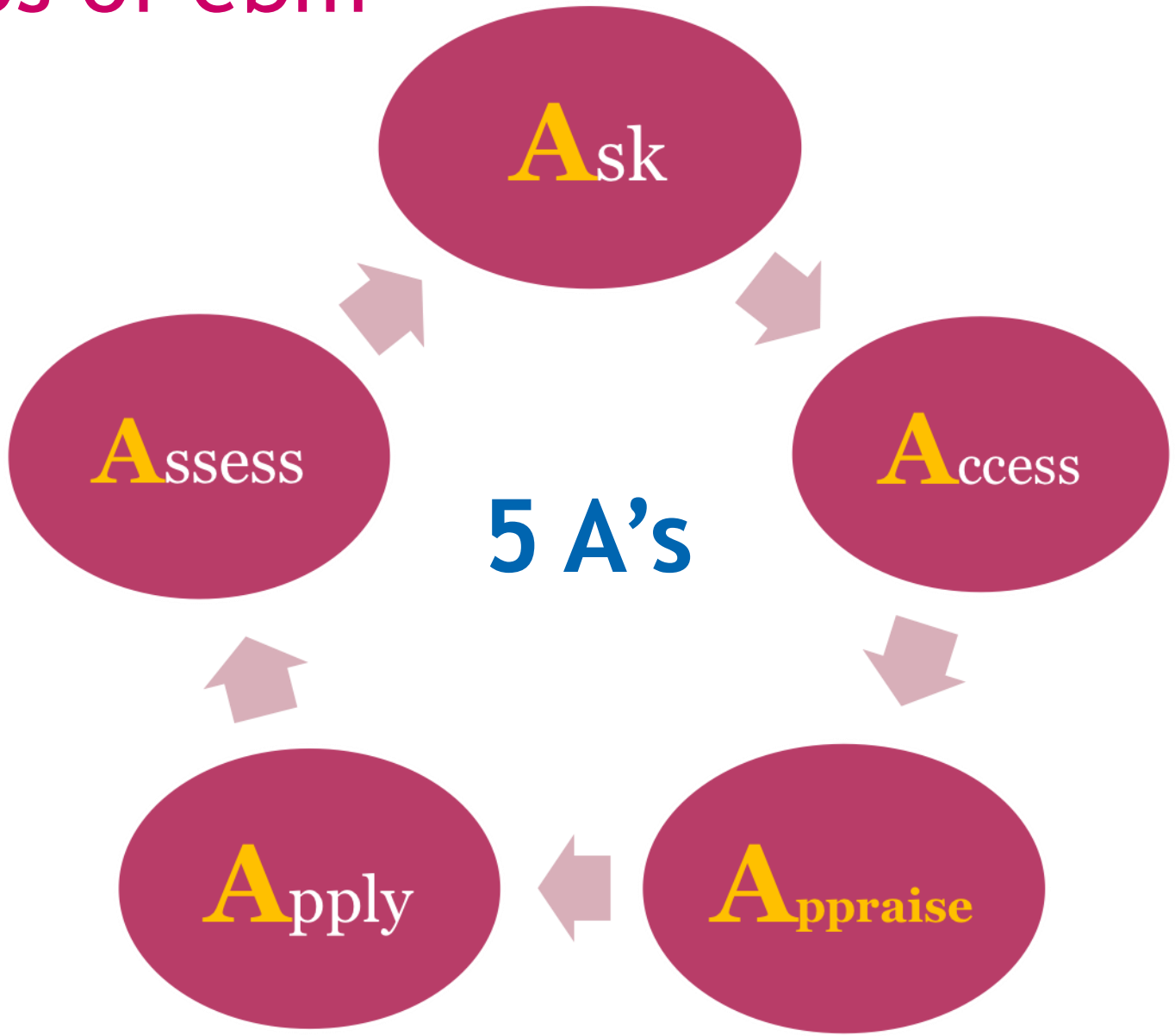
What is Evidence-Based Medicine

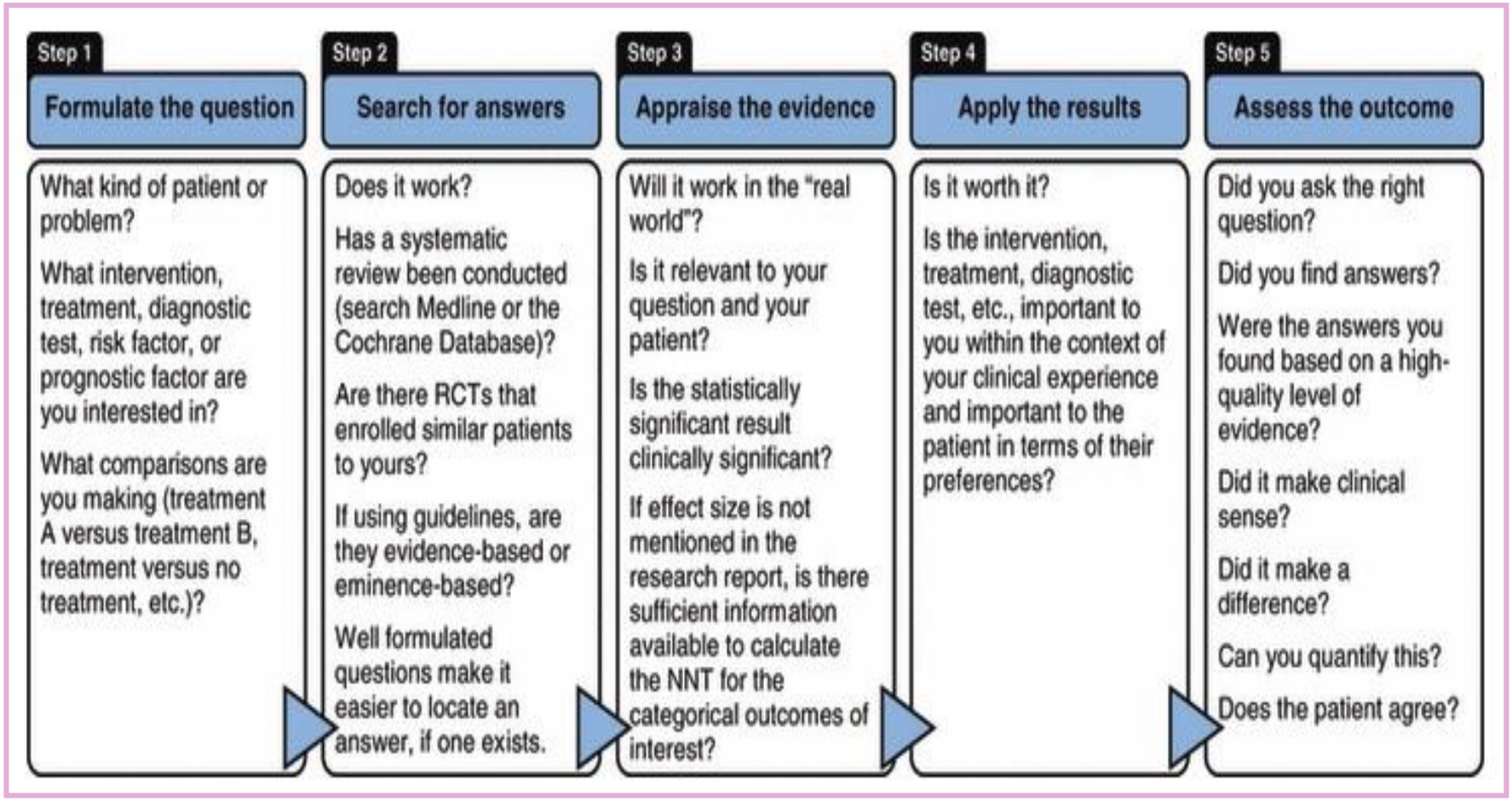


"Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values"
(Sackett, et al 1992)


Individual Clinical Expertise
Improved Patient Outcomes
Patient's Values and Expectations
Best Available Clinical Evidence

Steps of ebm





(Citrome, & Ketter, 2009)

ASKING THE RIGHT EBM QUESTION

The Process of Creating an Effective EBM Question

Complete a PICO (Richardson, 1995)

- Add specifications to your question using a PICO table to further refine it.

P: What types of patients and pathologies do you want to study or exclude from the study?

I: What variations of the treatments o interventions do you want to consider or exclude?

C: You would to compare with other modality

O: What specific outcomes or complications are the most important to measure and evaluate?

Formulating Answerable Clinical Questions

- Every time we see a patient, we need new information about some element of the **diagnosis, prognosis or management**.

- Because our time to try to find this information is often limited, we need to be very efficient in our searching.

Background and Foreground Questions

Background Questions

Foreground Questions

Background Questions

- These questions generally from basic science; ask what, when, how, and where about the disease, disorder, or treatment for instance,
- “What is otitis media?”
- or “How does amoxicillin work?” etc.
- What is the pathophysiology of migraine

- These types of questions can be answered by going through text books.

Foreground Questions

- **Complex clinical questions** are best answered by going to the primary or pre-assessed studies in the literature.

- **These patient-centered problematic questions, involve interpretation and consideration of the risks vs. benefits for a patient or group of like patients.**

Foreground Questions

- This can be approached efficiently and effectively if you start by first systematically clarifying the question (PICO),

- Using the PICO acronym will help you organize your query into a searchable foreground question.

PICO:

- **Patient/Problem**
- **Intervention**
- **Comparison/Control**
- **Outcome/Effects**

Question Categories:

- **Identify the question type to consider appropriate studies and data sets.**
- Diagnosis
- Diagnostic Test
- Harm/Etiology
- Prognosis
- Prevention/Therapy

Foreground Questions

- The patient-oriented questions involving interpretation of a therapy or disease and consideration of risk vs. benefit for a patient or a group of patient.
- These types of complex clinical questions are best answered by primary or pre-assessed studies in the literature.

Case 1

- In children with acute otitis media (P), is cefuroxime (I) effective in reducing the duration of symptoms (O) as compared to amoxicillin (C)?

- Does surgical procedure has better outcome for the treatment of otitis media in children after repeated antibiotic therapy?

Case 2

- **In patients with type 2 diabetes and obesity, is bariatric surgery more effective than standard medical therapy at increasing the probability of remission of diabetes?**

Scenario and Question

- **CASE-2:**
  A healthy adult presents to the clinic inquiring about the aspirin that it might prevent heart attack ?

The Question

- **"In an asymptomatic adult and no risk factors, would the use of aspirin reduce the incidence of cardiovascular events?**

Aspirin and Primary Prevention

1. Patient population.	**Asymptomatic adults with no risk factors**
2. Intervention.	Aspirin
3. Comparison intervention.	Placebo
4. Outcomes.	Incidence of CV events

"In asymptomatic adults no risk factors, would the use of aspirin reduce the incidence of cardiovascular events?

Scenario and Questions (Cont'd)

Scenario

A 32-year-old man, single, teacher in primary school, known to have IBS for last 3 years with no response to conventional medication. I decided to search for effect of TCA in patients with IBS.

Use of TCA in IBS

1. Patient population. **Middle age adults with IBS**

2. Intervention. Using of TCA

3. Comparison intervention. dietary fibers, bulking agents and mebeverne

4. Outcomes. Relieving of symptoms

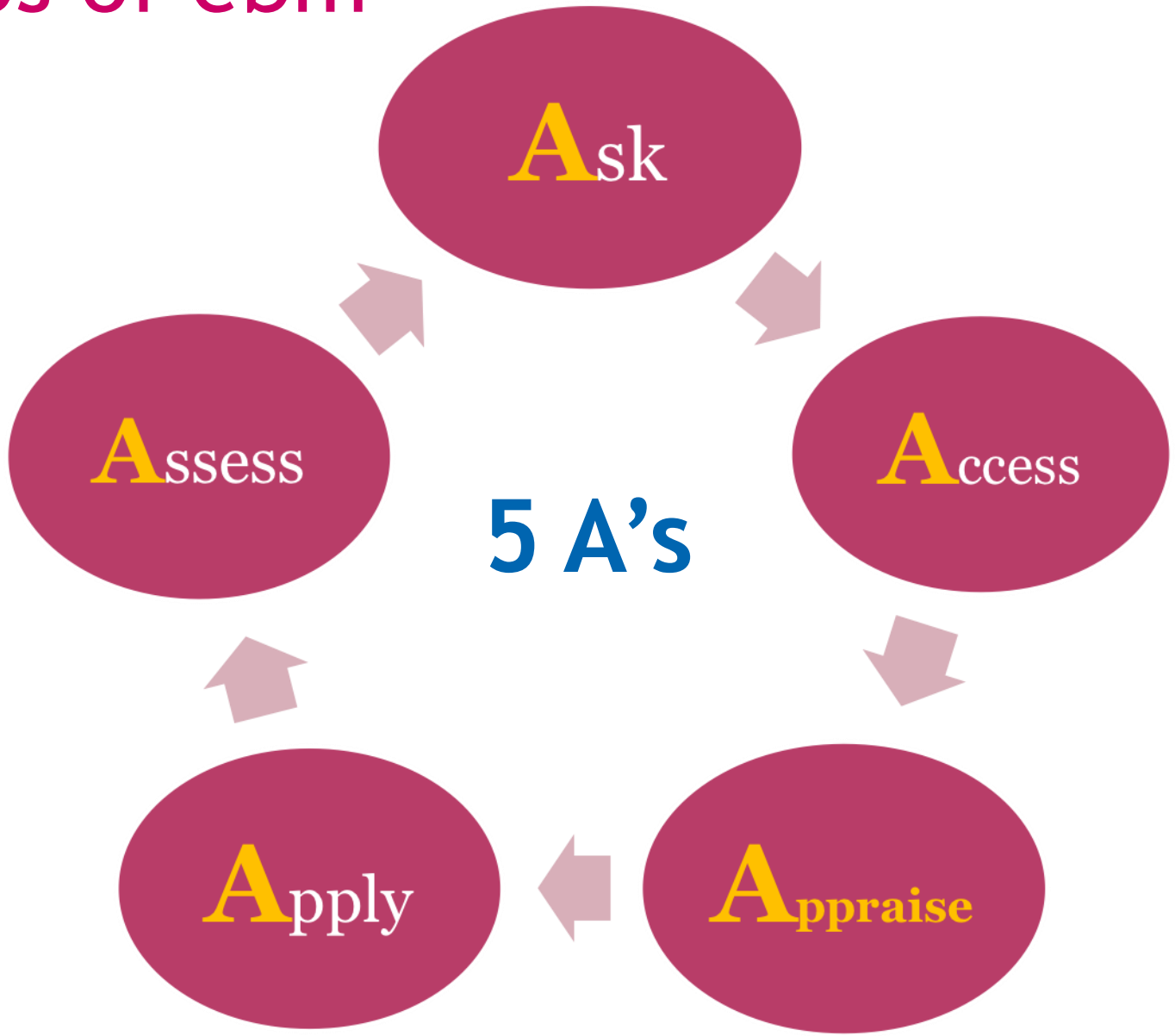
"In middle age adults with IBS, would the use of TCA reduce the pain and improve symptoms?

Type of Question

- Two additional elements of the well-built clinical question are *the type of question* and *the type of study*.
- This information can be helpful in focusing the question and determining the most appropriate type of evidence or study.

EBM PRINCIPLES: Search Skills

Steps of ebm



Sources of information and evidence may include:

- Colleagues
- Textbooks
- Journal articles
- Guidelines
- Care maps or disease guidance systems

Search for the Best Evidence

- ~~Review articles~~
- Community/professional standards
- Systematic reviews
- Original results

“Best Available Clinical Evidence”

- Therapy
  - Double-blind, placebo-controlled, randomized clinical trial
- Diagnosis
  - Independent, blind comparison with a reference standard
- Prognosis
  - Representative and well-defined prospective cohort of patients at a similar point in the course of disease

Primary & Secondary Evidence

- Primary: any published study without appraisal
- Secondary: Let someone else do the heavy work (Appraisal)

Secondary literature:

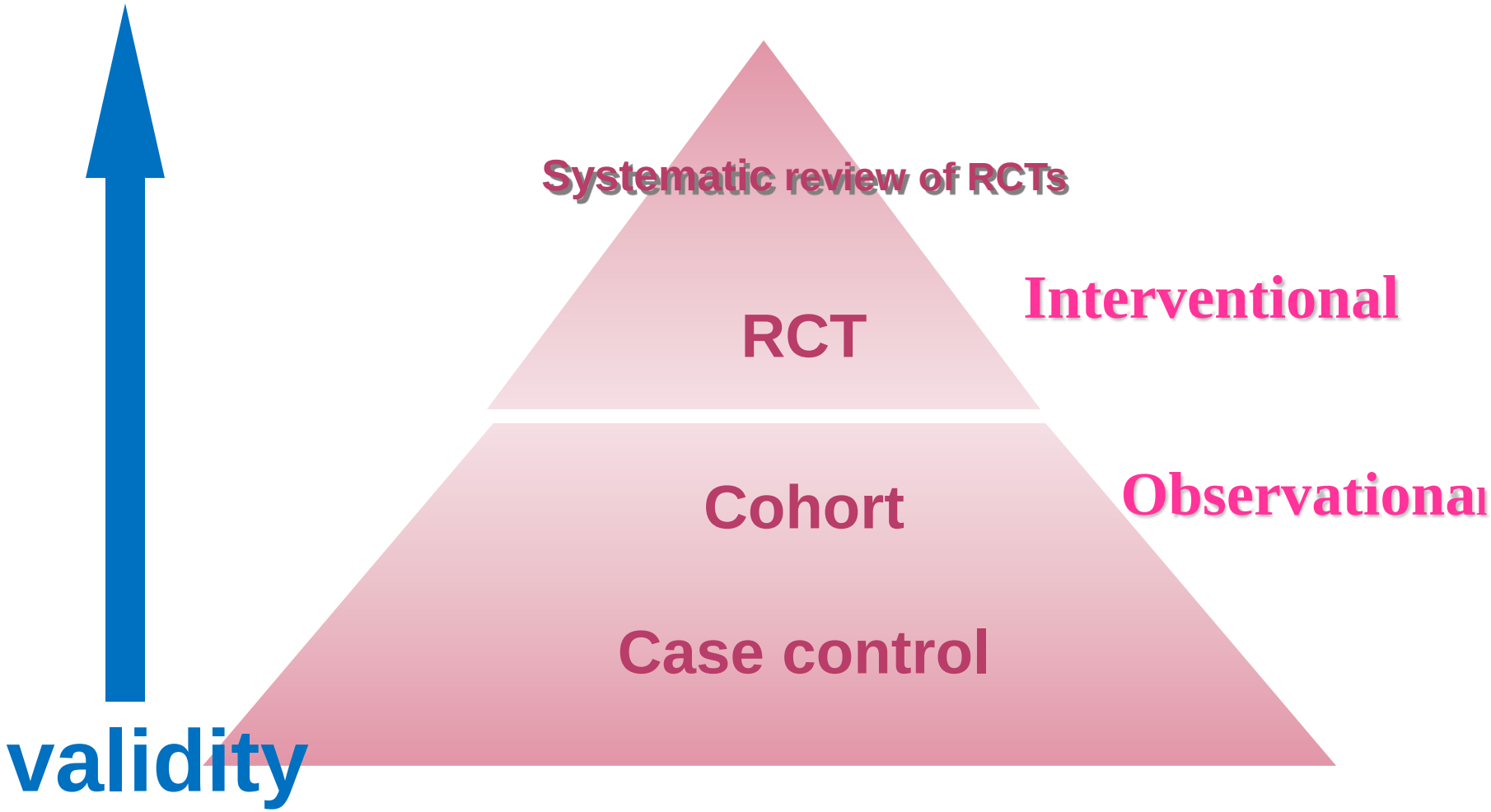
clinical evidence

TRIP+ Database Plus

MedicalInfoRetriever.com
InfoPoems

the cochrane library

Hierarchy of major study designs



Key points

- Searching for evidence that search terms are referred back to your original PICO question.
- The process of finding evidence therefore follow three key steps;
  - Identify terms to fit PICO question,
  - Look for secondary sources
  - then apply, assess.

Conclusion

- Evidence-based Health Care is necessaty and not the luxury.
- Keep asking questions in PICO form that will help in getting the answer faster.
- For beginner is more prudent to look for secondary evidence to get the answer faster
- We should develop slowly skills for critiacally reading and analyzing the evedence


Thank You!