

Tutorial: How to Form an Answerable Clinical Question

If you have any questions about this material, please contact the Clinical Effectiveness Education Specialist at x60396.

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Learning Objectives

- Identify the model to create a well-built Clinical Question
- Differentiate between the various Evidence-Based Care Types of Questions / Study Designs
- Review Clinical Scenarios

There are five steps to providing Evidence-Based Care (EBC):

You are here



- 1. ASK = Develop your answerable clinical question**
2. ACQUIRE = Efficiently find the best evidence
3. APPRAISE = Critically evaluate the evidence for its validity and usefulness
4. APPLY = Use the results of the appraisal in your clinical practice
5. ASSESS = Evaluate your performance

Efficiency is Key

- Finding the right information in the most efficient manner is key to successfully practicing evidence-based decision making.
- Knowing what key components to use in your search strategy will help you develop that efficiency.
- These key components of interest are:
 - Patient/Population
 - Intervention/Exposure
 - Comparison
 - Outcome

The Well-Built Clinical Question: “PICO” Model

- Patient / Population / Problem (*among* _____)
- Intervention / Exposure (*does* _____)
- Comparison (*versus* _____)
- Outcome (*affect* _____)

P = Patient/Population of Interest

- Who are the patients of interest?
- Is there a particular age group, gender or population?
- What is the health concern?

- Example: For persons entering a health care facility.....

I = Intervention or Exposure

- What therapeutic, diagnostic, preventive or other health care interventions are you interested in knowing more about?
- What health care management strategies are you interested in comparing?
- Example: For persons entering a health care facility, **is hand rubbing with a waterless, alcohol-based solution.....**

C = Comparison of Interest

- Is there a comparison to be evaluated against the intervention?
- Only used if more than one intervention or if no intervention is a factor.
- Example: For persons entering a health care facility, is hand rubbing with a waterless, alcohol-based solution, **as effective as standard hand washing with antiseptic soap.....**

O = Outcome of Interest

- What is the desired outcome to be evaluated?
- How will the patient or population be affected, or not affected, by the intervention?

- Example: For persons entering a health care facility, is hand rubbing with a waterless, alcohol-based solution, as effective as standard hand washing with antiseptic soap **for reducing hand contamination?**

- In addition to the PICO elements of your clinical question, it's important to know:
 - What TYPE of question are you asking?
 - What is the best STUDY DESIGN to search for to find evidence to answer your clinical question?
- So let's look at how to add these to the PICO model....

P.I.C.O. (T.T.) Model for Clinical Questions

P	Patient, Population, or Problem	How would I describe a group of patients similar to mine?
I	Intervention, Prognostic Factor, or Exposure	Which main intervention, prognostic factor, or exposure am I considering?
C	Comparison to Intervention (if appropriate)	What is the main alternative to compare with the intervention?
O	Outcome you would like to measure or achieve	What can I hope to accomplish, measure, improve or affect?
T	What type of question are you asking?	Therapy/Treatment, Diagnosis, Prognosis, Harm/Etiology (may be referred to as “domains” in PubMed)
T	Type of study you want to find	What would be the best study design/methodology?

What type of question are you asking and what will the evidence support?

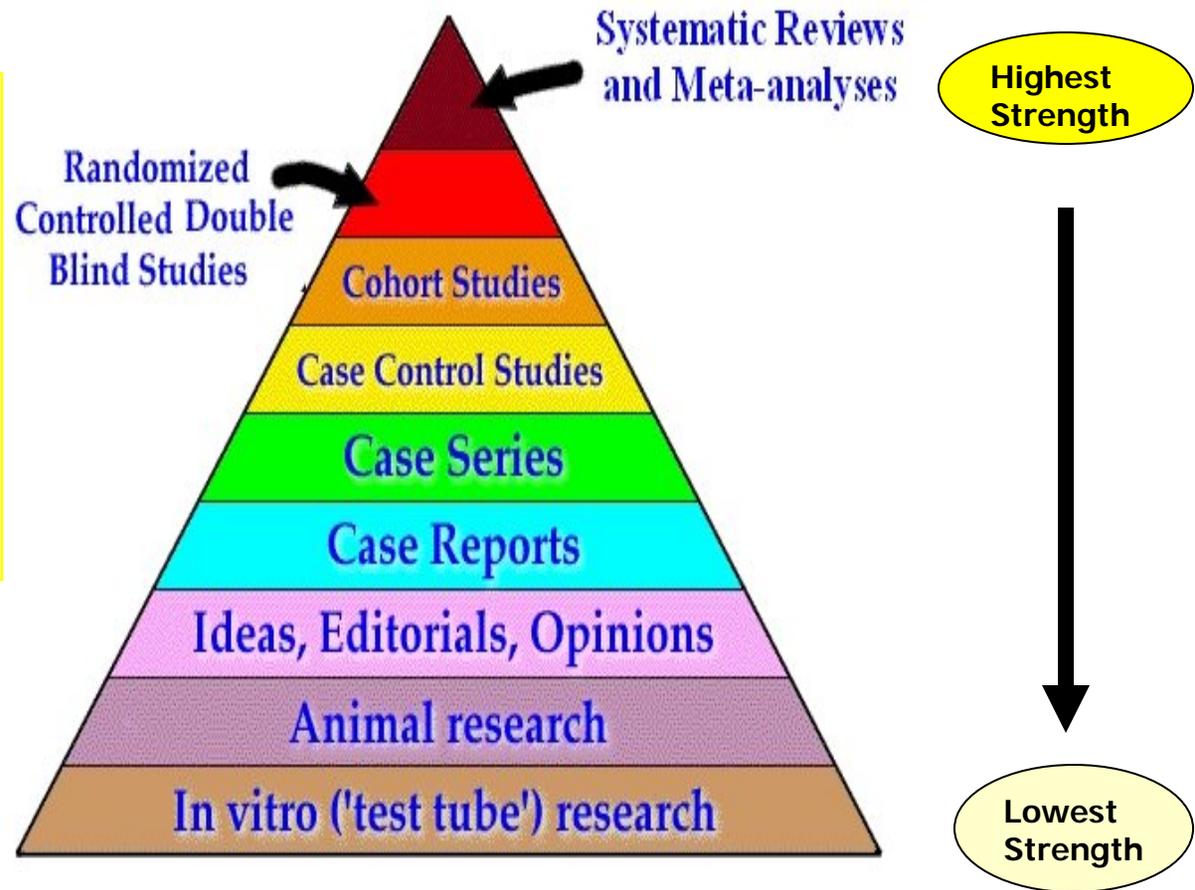
- **Therapy/Treatment questions:** evidence supports how to select treatments to offer your patients that do more good than harm and that are worth the efforts and costs of using them.
- **Diagnosis questions:** evidence supports how to select and interpret diagnostic tests, in order to confirm or exclude a diagnosis, based on considering their precision, accuracy, acceptability, expense, safety, etc.
- **Prognosis questions:** evidence supports how to estimate your patient's likely clinical course over time and anticipate likely complications of the disorder.
- **Harm/Etiology questions:** evidence supports how to identify causes for disease (including its iatrogenic forms).

Type of Question/Domain	Type of Study/Methodology
Therapy/Treatment Selection of treatments or interventions that do more good than harm and that are worth the effort and cost	Double-Blind Randomized Controlled Trial Systematic Review/Meta Analysis of RCT
Diagnosis Selection and interpretation of diagnostic tests, in order to confirm or exclude a diagnosis, based on considering their precision, accuracy, acceptability, expense, safety, etc	Controlled Trial Systematic Review/Meta Analysis of Controlled Trial
Prognosis Estimation of a patient's likely clinical course over time and anticipation of likely complications of disease	Cohort Studies, Case Control, Case Series
Harm/Etiology Identification of causes or risk factors for disease	Cohort Studies
<i>Prevention</i>	<i>Randomized Controlled Trial, Cohort Studies</i>
<i>Quality Improvement</i>	<i>Randomized Controlled Trials</i>

Adapted from: Sackett et al.'s *Evidence-Based Medicine: How to Practice and Teach EBM*

Strength of Study Design: The Evidence Pyramid

Find the highest strength of evidence available to answer your clinical question.



<http://library.downstate.edu/EBM2/2100.htm>

Limits of PICO (TT)

- This model works best for Therapy/Treatment & Diagnosis questions.
- Remember, PICO (TT) is a model, not a rigid structure.

- The next series of slides will present you with clinical scenarios and ask you to identify for each:
 - **What is your clinical question in PICO format?**
 - **What type of clinical question is this?**
 - **What is the best study design to answer this type of clinical question?**
- Before advancing slides after each clinical scenario, take a few moments to see if you can answer the questions on your own.

Clinical Scenario #1

- On morning rounds in the Hem/Onc unit, a first year resident turns to you for consultation. She wants to discuss options for managing moderate nausea and vomiting that result following chemotherapy. She shares an experience a relative had taking ginger when prochlorperazine didn't provide effective relief and asks for your input.

What is your clinical question in PICO format?

What type of clinical question is this?

What is the best study design to answer this type of clinical question?

Answerable Clinical Question

PICO:

- P – In patients receiving chemotherapy who are experiencing moderate nausea and vomiting
- I – is the use of ginger
- C – as effective as prochlorperazine
- O – in reducing nausea and vomiting?

Type of Question: Therapy/Treatment

Type of Study/Methodology: Double-Blind Randomized Controlled Trial; Systematic Review/Meta Analysis of RCT

Clinical Scenario #2

- Traditionally, clinicians have used a conservative approach to the diagnostic evaluation of head-injured infants, arguing that infants are at increased risk of intracranial injury (ICI) and that symptoms or signs of brain injury may not be reliably present in those with ICI. A number of previous studies have reported that a significant fraction of ICIs in infants occur in patients with a normal neurological status and with no signs or symptoms of brain injury. You want to see how well clinical features predict ICI in infants.

Adapted from: Greenes D, Schutzman S. Clinical Indicators of Intracranial Injury in Head-injured Infants. *Pediatrics* 1999; 104 (4): 861-867.

What is your clinical question in PICO format?

What type of clinical question is this?

What is the best study design to answer this type of clinical question?

Answerable Clinical Question

PICO:

- P – Among children with minor head injury
- I – does the use of CT scan
- C – versus other clinical findings
- O – affect identification and diagnosis of intracranial hemorrhage?

Type of Question: Diagnosis

Type of Study/Methodology: Controlled Studies;
Systematic Review/Meta Analysis of Controlled Studies

Clinical Scenario #3

- 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 scenario raises multiple questions, and the focus here will be: When is antibiotic therapy indicated?

Adapted from: <http://pedsinreview.aappublications.org/cgi/reprint/24/8/265.pdf>

What is your clinical question in PICO format?

What type of clinical question is this?

What is the best study design to answer this type of clinical question?

Answerable Clinical Question

PICO:

- P – Among toddlers with recurrent nasal discharge
- I – does the use of antibiotics
- C –
- O – affect the probability of recurrence?

Type of Question: Prognosis

Type of Study/Methodology: Cohort Studies

Clinical Scenario #4

- The traditional view of withholding feeds in VLBW infants has recently been challenged. Provision of trophic feeds has been found to result in faster maturation of the gut, making it much more receptive for subsequent enteral feeds. You've been asked to find the evidence on whether feeds should be administered fast or slow to this vulnerable population.

What is your clinical question in PICO format?

What type of clinical question is this?

What is the best study design to answer this type of clinical question?

Answerable Clinical Question

PICO:

- P – Among very low birth weight infants,
- I – are slow enteral feeds
- C – vs. fast enteral feeds
- O – better tolerated

Type of Question: Therapy/Treatment

Type of Study/Methodology: Systematic Review/Meta Analysis of Double-Blind Randomized Controlled Trials

Clinical Scenario #5

- Working on the Developmental Assessment Team for school-aged children of mothers who used cocaine during their pregnancy, you are interested in learning the developmental outcomes for these children as they begin school compared to children not exposed to cocaine during pregnancy.

What is your clinical question in PICO format?

What type of clinical question is this?

What is the best study design to answer this type of clinical question?

Answerable Clinical Question

PICO:

- P – (controlling for confounding factors) Do otherwise healthy children
- I – exposed in utero to cocaine,
- C – compared to children not exposed to cocaine
- O – have increased incidence of learning disabilities at age six years?

Type of Question: Harm/Etiology

Type of Study/Methodology: Cohort Studies

Clinical Scenario #6

- Forced use, or constraint-induced movement therapy (CIMT) has shown some efficacy in the rehabilitation of adults with chronic hemiparesis as a result of stroke. You are asked to provide a Lunch and Learn for your department on the use of CIMT versus conventional PT/OT therapy to improve outcomes for the management of hemiparesis associated with cerebral palsy in pediatric patients.

What is your clinical question in PICO format?

What type of clinical question is this?

What is the best study design to answer this type of clinical question?

Answerable Clinical Question

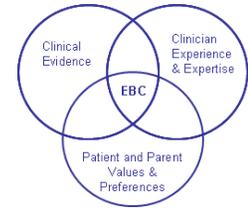
PICO:

- P – Among children receiving PT/OT for the management of hemiparesis associated with cerebral palsy
- I – does constraint induced therapy
- C – compared to conventional PT/OT therapy
- O – improve outcomes (motor skills / function)?

Type of Question: Therapy/Treatment

Type of Study/Methodology: Double-Blind Randomized
Controlled Trial

In Summary



- Finding the right information in the most efficient manner is key to successfully practicing evidence-based decision making.
- Using the PICO model to determine your clinical question will help you develop that efficiency.
- Knowing what TYPE of clinical question you are asking will help you know what is the best study design to provide evidence to answer your clinical question.

For more information on instructor-led EBC education, please contact the Clinical Effectiveness Education Specialist at X60396.

- **EBC 101 (one hour):**
 - This workshop is an introduction to the basics of Evidence-Based Care and the implementation tools at CCHMC to assist in making the best evidence-based care decisions for patients.
- **How to Form an Answerable Clinical Question (one hour):**
 - This workshop is designed to guide the development of clinical questions, which will define the criteria for a more precise electronic literature search. The PICO model will be presented.
- **Electronic Literature Search (two hours)**
 - This hands-on workshop is led by Masters prepared Librarians. They will present the basic skills and the various available resources at CCHMC which are essential to a successful literature search to find the best evidence.

Continued.....

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- **Critical Appraisal of Treatment Literature (one and a half hours):**
 - This workshop describes the process of deciding whether a given treatment study is valid and can answer a specific clinical question. Also included will be a discussion of key concepts such as: Event Rates, Relative Risk, Absolute Risk Reduction, and Number Needed to Treat.
- **Critical Appraisal of Diagnosis Literature (one and a half hours):**
 - This workshop will focus on the concepts of Sensitivity, Specificity, Predictive Values and Likelihood Ratios that can help assess the validity of diagnostic research results. Additionally it will address how to apply the results to the patient.
- **Systematic Review and Meta-Analysis (one and a half hours):**
 - Systematic Reviews are comprehensive reports of all available evidence related to a specific question, including critical appraisal of study methods and results.
 - Meta-analysis are systematic reviews that use quantitative methods to summarize the results. This workshop will provide attendees with the skills to do both.

Acknowledgement

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