

Part 3: Asking foreground questions, PICO, and search strategies

As you have learned in the previous module, practitioners need to have general knowledge of the conditions (disorders) and potential interventions in any clinical encounter. We have shown you some great resources to find this background information.

As practitioners gain experience, they master the background knowledge and need to shift toward asking more complex and specific foreground questions. Foreground questions focus on and try to find relationships between

- (1) a specific patient
- (2) the patient's problem
- (3) possible interventions
- (4) and a clinical outcome.

Foreground questions are generally very detailed questions that can best be answered with the information contained in published research studies. To formulate a good foreground question, practitioners apply the acronym P-I-C-O also known as "PICO" as a framework to outline the clinical question.

P stands for the Patient, Population, or Problem (or Disease or Condition)

How would you describe patients similar to your own – what are their most important characteristics?

This can include the primary disease, co-existing conditions, gender, age, or race of the patient.

I stands for the Intervention, Exposure, Maneuver

Which intervention, risk factor, or exposure is being considered – what will you be doing for the patient?

This can include treatments or diagnostic tools. Was the patient exposed to something environmental or occupational?

C stands for Comparison or Control

Is there an alternative to compare to your intervention? (A "good" clinical question does not always need a comparison or control to be valid.)

O is the Outcome

What do you want to happen or what are you trying to do for the patient? Often, thinking about the desired outcome is the best place to start when formulating a question.

Let's go back to our scenario and apply the PICO framework to get a good clinical foreground question.

What is the P? That is, the patient and problem. The patient is a 73 yo female with the problem of amnesia

The I or intervention is simply lipitor

We are not looking at alternative interventions so there is no C or Comparison

And the clinical outcome is simply to improve the condition and even prevent alzheimer's disease

So our clinical question applying PICO in this scenario plays out like this:

In a 73 year-old female with mild amnesia and possibly early symptoms of alzheimer's disease does Lipitor reduce amnesia, dementia or prevent AD?

There are several benefits to formulating clinical questions clearly: One is that they help practitioners focus their scarce learning time on evidence that is directly relevant to the patient's clinical needs. Another is that they suggest high-yield search strategies.

Let's convert our clinical question into a good basic search strategy that we can use to find research published in health literature databases.

To do this, one should look at the P-I-C components of PICO and develop possible search terms. In our scenario, there is no comparison.

Let's look at our P concepts first. Think of ways researchers or authors may refer to the concepts listed in the P. We also need to take into account the patient characteristics (such as age)

Now let's list the I terms: Our intervention is Lipitor, so some terms that may be used to refer to lipitor are: *Lipitor*, atorvastatin, statin, hydroxymethylglutaryl-CoA reductase inhibitors, HMG CoA reductase inhibitors

Now let's create a search query from these terms. The first thing I might do is eliminate the terms referring to age in this case because the research will most likely entail only this age group any way.

We have grouped the P terms and the I terms together. Now we can place an "OR" between synonyms of the same concept and surround concept terms with parentheses. The OR directs the databases to look for at least one of the terms. The parentheses help the database keep the search in the correct order.

Next, place an "AND" between different concepts. The AND directs the database to include at least one term for both concepts

Now, the health literature is replete with multiple terms with the same definition, so it is often necessary to find and include a variety of synonyms in a search query. There are a few tricks to finding good search terms for your PICO question.

One way is to check the MeSH database in PubMed for terminology. The MeSH database is, for the most part, a dictionary or thesaurus of medical terms. Let's take a look at the MeSH database for the term "lipitor"

To get to the MeSH database from the Ebling page, select PubMed. Once in, look in the left side panel of PubMed for the MeSH database.

Enter Lipitor. Up comes the term atorvastatin (the generic term). Also listed in the generic terms for statins: Hydroxymethylglutaryl-CoA Reductase Inhibitors

Other ways to find more relevant terms is by conducting a quick and dirty search in PubMed to look for spot-on articles, that is articles that closely match our PICO. Take a look at these articles in PubMed and

check the author language used or even take a look at the full Pubmed record to see what MeSH terms were used to describe that spot-on article.