Welcome to Search Concepts and Search Terms
The learning objectives for this tutorial are:

1. Explain why it is best practice to search concepts individually in a database
2. Produce a prioritized list of search concepts from PICO elements
3. Derive search terms from search concepts
The techniques discussed in this tutorial are part of the Acquire portion of the 5 A’s of the EBD Cycle. You have asked your question and are now working on acquiring information to answer it.
Identifying Search Concepts

Identifying search concepts.
Once the EBD question is clearly defined, you may be tempted to immediately plug your research question into a database, such as PubMed.

Do not do that.
Databases like PubMed are not people. They are computers. Talking to a database like it’s a person prevents you from using its higher-powered features. Remember that it’s a computer and harness that power. Instead of putting in a sentence or a question, identify the elements contained within your research question into search concepts you can then search for individually using search terms. Searching for concepts individually allows you to perform more advanced searching techniques that we will discuss in the Adjusting Results and Creating a Working Set tutorial.
In patients requiring a tooth extraction who have undergone head and neck radiotherapy does hyperbaric oxygenation or antibiotics lead to greater prevention of osteoradionecrosis?

**P:** Patients requiring tooth extraction who have undergone head and neck radiotherapy.

**I:** Hyperbaric oxygenation

**C:** Antibiotics

**O:** Prevention of osteoradionecrosis

Thankfully, since you built your research question from a PICO you’re already partway there to selecting initial search terms. These PICO elements are the search concepts you are interested in. The next step is to rank these in order of importance. This will aid you in selecting search terms later.
What is the most important part of this question?

**P:** Patients requiring tooth extraction who have undergone head and neck radiotherapy.

**I:** Hyperbaric oxygenation

**C:** Antibiotics

**O:** Prevention of osteoradionecrosis

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What is the most important part of this PICO?

Put another way, what is the one thing that any article answering this question absolutely must include in order to make a treatment decision?
Until you become more familiar with the EBD process, it may be difficult at first to determine which concepts are more important. Here are some questions to consider to help in making that determination.

- Is the inclusion of this precise concept essential to my treatment decision? If yes, it’s more important.
- Could I still get a satisfactory answer to my question if I found articles about a similar yet different concept? If yes, it’s less important.
- Does the inclusion of this concept provide essential clarification of the rest of the concepts I want to search? If yes, it’s more important.
- Is it possible for an article to not mention this concept at all but still be relevant to my treatment decision? If yes, it’s less important.

Questions to consider when determining which concepts are more important:

- Is the inclusion of this precise concept essential to my treatment decision? If yes, it’s more important.
- Could I still get a satisfactory answer to my question if I found articles about a similar yet different concept? If yes, it’s less important.
- Does the inclusion of this concept provide essential clarification of the rest of the concepts I want to search? If yes, it’s more important.
- Is it possible for an article to not mention this concept at all but still be relevant to my treatment decision? If yes, it’s less important.
In the case of this particular PICO question, our most important aspect is the O. If we found an article about hyperbaric oxygenation and antibiotics that didn’t discuss osteoradionecrosis at all, it would be useless to our largest concern, which is preventing osteoradionecrosis in this patient population. Thus, the O is the most important search concept. The most important search concept is not always the O. Which element it is varies from question to question.
What is the second most important part of this question? This is the concept or concepts that ideally our article will directly address. Well, we’re most interested in whether our Intervention or Comparison is the most effective in preventing osteoradionecrosis. Does one matter more than the other? No, ideally we’d find an article looking at both. They’re equally important. It’s also possible to have more than one concept that are the most important. This is also variable from question to question.
We now have one concept left, so that means that our P is the third most important. Ideally we would find an article looking at patients getting a tooth extracted whose osteoradionecrosis is prevented by either hyperbaric oxygenation or antibiotics, but could we also consider a patient having another type of oral surgery if no relevant articles exist about tooth extraction? Absolutely. That means that while the P is relevant it’s the least important concept.
Now that we know our search concepts, it’s time to select search terms.
An Important Note on Search Term Selection

Search term selection is **strategic**.

Omitting a concept from search term selection ≠ Omitting a concept from article selection

Search term selection needs to be strategic considering the ultimate combination of terms together, as well as acknowledging how concepts are usually discussed in the scientific literature. Omitting a particular concept from search term selection should not be conflated with omitting that same concept from article selection. In some cases, the concept is implied by other search terms and so you do not need to search for it as a search term but still should look for it with your eye when looking through the articles, especially if you’ve ranked it as more important.

But how do you know how to be strategic when you’re new to searching? This is how the importance ranking can help you.
### Questions to consider when selecting search terms:

- Is it clinically relevant?
- Is the concept implied?
- Does the term have different meanings depending on the discipline?
  - Is *dentistry* implied or do I need to explicitly state it?
- Is it an acronym?
- Is there a generic name, as opposed to proprietary?

You won’t just type each search concept word for word into your database. Rather, you will use these concepts as a guide for search term selection. When selecting search terms, we have some questions to guide you toward choosing the best initial search term. You’ll ask these questions of each individual search concept, starting with the one ranked most important. Let’s look at our most important concept.
Prevention of osteoradionecrosis.
Is it clinically relevant? Yes.

Is the concept implied? We have nothing else we’re searching for yet, so osteoradionecrosis is not. However, most likely an article in the scientific literature about a negative outcome such as osteoradionecrosis will be about preventing it, even if it doesn’t explicitly say prevention in the title or abstract. This concept is implied, so we can leave it out.

Does the term have different meanings depending on the discipline? Not, osteoradionecrosis is osteoradionecrosis.

Is it an acronym? No.

Is there a generic name? This usually applies to drugs. Osteoradionecrosis is a condition, not a drug, so no.

Therefore, our first search term is osteoradionecrosis.

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Two concepts tied for being second most important, but it’s easier to look at concepts individually when selecting search terms. It doesn’t matter which order we look at them, so let’s just start with the Intervention, hyperbaric oxygenation. Now, work through these questions again.

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Two concepts tied for being second most important, but it’s easier to look at concepts individually when selecting search terms. It doesn’t matter which order we look at them, so let’s just start with the Intervention, hyperbaric oxygenation. Now, work through these questions again.

Is it clinically relevant? Yes.
Is the concept implied? No.
Does the term have different meanings depending on the discipline? No.
Is it an acronym? No.
Is there a generic name? No.
Therefore, our second search term is hyperbaric oxygenation.

Next, let’s look at the Comparison.
As with the Intervention, the Comparison, antibiotics, is also clinically relevant and not implied, so after considering the rest of the questions, we determine that the appropriate search term is antibiotics.
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While the third most important concept is about our patient, the actual term patient need not be included as a search term since it is implied by the fact that we’re looking at a treatment for a problem. Since osteoradionecrosis only occurs if a patient has previously had radiotherapy, head and neck radiotherapy is implied as well, and we don’t need to search for it.

The term extraction, however, could have different meanings depending on the discipline, therefore we retain tooth extraction as the search term.
Here are our references.

Thank you.