Asking an Appropriate Foreground Question
Learning Objectives

- Summarize the difference between a background and a foreground question
- Recognize and define PICO format
- Determine if a foreground question is appropriate
- Identify the appropriate domain for a given PICO

The learning objectives for this tutorial are:
1. Summarize the difference between a background and a foreground question
2. Recognize and define PICO format
3. Determine if a foreground question is appropriate
4. Identify the appropriate domain for a given PICO
Evidence-Based Dentistry is the intersection of clinical expertise, scientific evidence, and patient needs and preferences.

The process of EBD follows a cycle known as The 5 A’s.
The EBD Cycle: The 5 A’s

Seeing your patient leads into the cycle, as the patient prompts you to ask a question.
| 2 main categories of questions: | Background | & | Foreground |

There are two main categories of questions that emerge from the patient encounter:

Background and foreground.
Background questions fill in your knowledge gaps and often lay the groundwork asking an appropriate foreground questions – they seek information that dentistry as a whole knows (established knowledge) on a broad topic but that you yourself might not know. These are answer-oriented who, what, where, when, why, and how questions – the fact is the focus of the question. They are often answered with textbooks.

- General, established, broad knowledge
- Usually about a single concept
- Answer-oriented: Who, what, where, when, why, and how
- Often answered with textbooks

What causes TMJ?
What are the side-effects of Metformin?

Finding these answers lays the groundwork for foreground questions
Foreground questions should address a decision point in clinic. They do this by seeking specific knowledge for application in clinical decision making regarding a specific patient or population. In other words, they are patient-oriented. Usually they will compare two treatment options or populations and are often answered with journal articles.

- Address a decision point in clinic by:
  - Seeking specific knowledge for application in clinical decision making
  - Regarding a specific patient or population (patient-oriented)
  - Usually comparing two treatments or populations

- Often answered with journal articles

Do patients with a partially edentulous maxilla report higher satisfaction with an implant retained RPD than patients with a conventional RPD?

In adult patients who smoke do implants with an acid-etched surface or hydroxyapatite coated implants have greater longevity?
PICO: A Professional Standard

P = Patient or population

How would you describe a group of patients similar to your own?
What is the condition or disease you are interested in?

It is the professional standard to put foreground questions into the PICO format, which is a way of breaking down your clinical question into researchable parts.

P stands for patient or population. Consider how you would describe a group of patients similar to your own? What is the condition or disease you’re interested in?
PICO: A Professional Standard

P = Patient or population
   How would you describe a group of patients similar to your own?
   What is the condition or disease you are interested in?

I = Intervention
   What do you want to do to this patient (treat, diagnose, observe)?
   Usually the newer (non-standard) treatment option

I stands for Intervention. This is what you want to do to this patient. Are you treating, diagnosing, or observing? This is usually the newer (non-standard) treatment option.
C is comparison. It is usually the main alternative or what is traditionally done compared with the intervention. It is very important to note that sometimes the main alternative is something that may not feel like a treatment but is still an action such as placebo, watchful waiting, or treatment as usual.
PICO: A Professional Standard

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   What is the condition or disease you are interested in?

I = Intervention
   What do you want to do to this patient (treat, diagnose, observe)?
   Usually the newer (non-standard) treatment option

C = Comparison
   What is the main alternative (gold standard) to compare with the intervention?
   Sometimes the main alternative is a placebo, watchful waiting, or treatment as usual.

O = Outcome
   What can you hope to improve, accomplish, measure, or affect?
   What are the relevant outcomes? (comfort, cost, quality of life, longevity)
   The outcome should be patient-oriented -- something the patient cares about and be described in a way the patient understands.

O stands for outcome. What are you hoping to improve, accomplish, measure, or affect? It’s very important to remember that this should be patient-oriented, which means it should be something the patient cares about and be described in a way the patient understands.

Let’s try applying this asking the question process to a sample patient.
Your 58-year-old patient, John, presents at your office stating that chewing is difficult for him due to his damaged teeth. You find that teeth numbers 7 and 8 both are hopeless and will need to be extracted. You note in John’s patient history that he has Gastroesophageal Reflux Disease (GERD) and is a survivor of esophageal cancer. He indicates that he last had radiation treatment for cancer to his head and neck 5 years ago.

Seeing this patient brings a question to your mind......
For patients who have undergone head and neck irradiation does tooth extraction pose a risk of osteoradionecrosis?

You feel like this is probably a foreground question and are getting ready to put it into PICO format.

But wait!

Is it an appropriate foreground question?
To help determine, if the question is appropriate, consider the following two questions: Is this established knowledge, and Is the question clinically relevant?

In other words, is your question spurred by a decision point in the clinical encounter?

If it is not established knowledge and it is clinically relevant, then it is an appropriate foreground question. Both criteria must be met in order to be an appropriate foreground question. If just one is not met, it is not an appropriate foreground question.
Let’s apply this to your proposed foreground question.

Is this established knowledge? As you gain experience and expertise, you may know right away if the answer is established knowledge. For now, consult a textbook. In this case, you go to Stat!Ref to search multiple textbooks simultaneously and quickly find in Oral and Maxillofacial Pathology that yes, the answer is well-established – tissue is more likely to become osteoradionecrosis after radiation.
Since this question represents established knowledge, you technically have enough information to determine if it is an appropriate foreground question, but to clarify, you may still ask, Is the question clinically relevant? In particular, would the answer to the question affect the treatment of the patient? His teeth need to be extracted whether or not he’s at greater risk of osteoradionecrosis, so no it does not.

Based on the answers to these questions, you determine that this is not an appropriate foreground question to ask for your patient.
Knowing this, what question comes to your mind next?

Is there a way to prophylactically treat John to minimize his risk of osteoradionecrosis? Some sources recommend HBOT and others antibiotics. This gives you a clinical question that is not established knowledge and whose answer will directly impact the treatment plan for your patient. It is appropriate. Now you can proceed with breaking it down into a PICO.
Clinical Question: Does prophylaxis HBOT prior to extraction have less chance of developing Osteoradionecrosis compared to antibiotics in irradiated patients?
Clinical Question: Does prophylaxis HBOT prior to extraction have less chance of developing Osteoradionecrosis compared to antibiotics in irradiated patients?

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

Your patients are receiving extractions and are irradiated.

When writing this into the PICO, spell it out more and state it more clearly. For instance, don’t assume extraction always means tooth extraction. Actually state tooth extraction.

What is the intervention you want to try?
Clinical Question:
Does prophylaxis HBOT prior to extraction have less chance of developing osteoradionecrosis compared to antibiotics in irradiated patients?

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

**I:** Hyperbaric oxygenation

Prophylaxis HBOT. When putting this into the PICO, you don’t need to state prophylaxis. This is understood.

When using acronyms, consider what they stand for and spell them out. HBOT stands for hyperbaric oxygenation therapy. It’s assumed you’re using this therapeutically because of the P, so you don’t really need to say the therapy part. This leaves you with hyperbaric oxygenation.

What are you comparing your intervention to?
Does prophylaxis HBOT prior to extraction have less chance of developing Osteoradionecrosis compared to antibiotics in irradiated patients?

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

I: Hyperbaric oxygenation

C: Antibiotics

Antibiotics. For the purposes of this question, it doesn’t matter which specific antibiotic is used, so you can leave this as is.

Next, look to the O. What is the outcome you either want to happen or to avoid? And is it something you can explain to your patient?
In this case, we’re looking to avoid Osteoradionecrosis. It’s important to state prevention in our Outcome, because it otherwise it could sound like we’re trying to cause this negative condition.
Finally, we need to write our PICO into the expected Foreground Question format. The goal of this is to enable stating your PICO in a simple sentence in conversation. In patients requiring a tooth extraction who have undergone head and neck radiotherapy, does hyperbaric oxygenation or antibiotics lead to greater prevention of osteoradionecrosis?

In patients requiring a tooth extraction who have undergone head and neck radiotherapy does hyperbaric oxygenation or antibiotics lead to greater prevention of osteoradionecrosis?

Notice that it’s asking for the same information as when we had it directly from our clinical experience. It just now sounds more professional.
Your PICO is then used to determine your question’s domain. The domain is the category that your foreground question falls into.

Why is the domain important? Domain helps focus your search by determining the type of information (study type) needed as well as in what order you should look for it. Study type will be looked at in more detail in the Appraising the Evidence tutorial.

So what are the domains?
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<th>Sample PICO</th>
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<td>Therapy</td>
<td>How to best treat the problem</td>
<td>In children with erupting molars do biannual fluoride varnish applications compared to biannual NaF applications better reduce caries?</td>
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There are five types of question domains.

Therapy covers how to best treat the problem.

Notice in the example that we are looking at two different dental treatment options to prevent a negative outcome (development of caries).
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<td>What causes the problem</td>
<td>For children with asthma does use of nitrous oxide for sedation pose a risk of asthmatic exacerbation?</td>
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Etiology slash Harm covers what causes the problem. Will this intervention possibly harm my patient? Or did this intervention lead to the development of a negative outcome?
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<td>What will the problem look like over time (based on factors that are not actions performed or advised by the dental care team) and anticipate likely complications of the problem</td>
<td>Are pediatric patients with Autism Spectrum Disorder compared to pediatric patients without Autism Spectrum Disorder at an increased risk for caries?</td>
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Prognosis addresses what the problem will look like over time based on factors that are not actions performed or advised by the dental care team and anticipate likely complications of the problem. These factors are often an illness or condition that the patient has. For instance, incidence of caries in patients with or without Autism Spectrum Disorder. You, the dentist, do not give your patient Autism. This is what makes it a prognosis question rather than a therapy question.
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<td>Determine the problem</td>
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Diagnosis looks at how best to determine whether and how severely the problem exists.
### Economic Analysis

Economic analysis looks at how much the problem will cost or what is the cost and or benefit of treating the problem with this intervention. You may be tempted to feel that cost is known since a clinic charges a set price for a treatment. However, economic analysis looks at much more than just what the initial treatment costs in a particular clinic. It will look at what the treatment cost is over time. Does the treatment need to be fixed or retreated frequently? Does it have other economic impact on the patient’s life?

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<td>Economic Analysis</td>
<td>How much will this problem cost or what is the cost/benefit of treating the problem with this intervention</td>
<td>For edentulous patients do implant-supported dentures or conventional dentures cost more over time?</td>
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What is the domain for our PICO?

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

**I:** Hyperbaric oxygenation

**C:** Antibiotics

**O:** Prevention of osteoradionecrosis

**Foreground Question:** In patients requiring a tooth extraction who have undergone head and neck radiotherapy does hyperbaric oxygenation or antibiotics lead to greater prevention of osteoradionecrosis?
It’s therapy. We are treating a problem with prevention by choosing prophylactic treatments.

Now that we have our PICO and know its domain, we’re ready acquire information by selecting search terms and searching.
Here are our references.

Thank you.