Searching Effectively & Efficiently

Techniques you can use to enhance your literature searching skills

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Many skills are required to conduct an effective literature search.
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The Evidence Cycle

ASSESS
clinical or policy problems and identify key issues

APPLY
evidence to clinical or policy problems

ASK
well-built questions that can be answered using evidence-based resources

APPRAISE
the validity, importance, and applicability of evidence that has been retrieved

ACQUIRE
evidence using selected, pre-appraised resources
Types of Questions: Background vs Foreground

Background:
• Deals with the general knowledge or basic understanding of a concept
• Information available in Books and Review articles

Foreground:
• Deals with a specific case or situation and involves the intersection of multiple concepts
• Information available in Journal articles
Identifying searchable terms

There are different techniques you can use to extract search terms from a question

- PICO
  - Patient-Problem-Population
  - Intervention
  - Comparison
  - Outcome
The PICO Method:
A system to help you frame your question into individual search concepts
PICO Method – What it means

• Using the PICO method involves breaking your question down into the following concepts:
PICO Method - Patient/Population/Problem

• Using the PICO method involves breaking your question down into the following concepts:
  – P = Patient/Population/Problem
    • What kind of disease is involved?
    • Who is affected by this issue?
    • What is the problem of interest to you?
PICO Method - Intervention

• Using the PICO method involves breaking your question down into the following concepts:
  – P = Patient/Population/Problem
  – I = Intervention
    • What is being done?
    • What effect is being introduced?
PICO Method - Comparison

• Using the PICO method involves breaking your question down into the following concepts:
  – P = Patient/Population/Problem
  – I = Intervention
  – C = Comparison
    • What else could be done?
PICO Method - Outcome

• Using the PICO method involves breaking your question down into the following concepts:
  – P = Patient/Population/Problem
  – I = Intervention
  – C = Comparison
  – O = Outcome
  
  • What is effect/impact of the intervention on the patient?
Bonus PICO(T) Element – Time/Type of Study

• Using the PICO method involves breaking your question down into the following concepts:
  – P = Patient/Population/Problem
  – I = Intervention
  – C = Comparison
  – O = Outcome
  – T = Time and/or Type of Study
PICO Method – Sample Question

• Let’s apply PICO to the following question:

– Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
PICO Method

• Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
  – P = Patient/Population/Problem
    • Oral Cancer
PICO Method

• Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
  – P = Oral Cancer
  – I = Intervention
  • Radiotherapy
PICO Method

- Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
  - P = Oral Cancer
  - I = Radiotherapy
  - C = Comparison
    - Not present
PICO Method

• Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
  – P = Oral Cancer
  – I = Radiotherapy
  – C = Null
  – Outcome
    • Failure/Survival of Dental Implants
PICO Method

• Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
  – P = Oral Cancer
  – I = Radiotherapy
  – C = Null
  – O = Dental Implant Failure/Survival
PICO Method – Putting it all together

• Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
  = Oral Cancer AND Radiotherapy AND Dental Implant Failure/Survival
PICO - Putting it all together

Oral Cancer

Radiotherapy

Dental Implant

Failure/Survival

Oral Cancer AND Radiotherapy AND Dental Implant Failure/Survival
Another way to think about it...

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

In this analogy, the question is the cookie and the search terms are the ingredients that are brought together to create it....
Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:
Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

• Flour
Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

• Flour
• Sugar
• Brown Sugar
Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
  - Semi-sweet? Dark? Milk? White?
  - Chips? Chunks? Mini-chips?
Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
- Vanilla?
Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
- Vanilla extract
Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
- Vanilla extract
- Eggs?
To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
- Vanilla extract
- Chicken Eggs
To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
- Vanilla extract
- Chicken Eggs
- Butter
What is MeSH?

MeSH Vocabulary tutorial

MeSH Indexing Tutorial
https://www.nlm.nih.gov/bsd/indexing/training/USE_010.html

The Medical Subject Headings (MeSH®) thesaurus is a controlled vocabulary produced by the National Library of Medicine and used for indexing, cataloging, and searching for biomedical and health-related information and documents.

MeSH includes the subject descriptors appearing in MEDLINE®/PubMed®, the NLM catalog database, and other NLM databases.
**Why do we need to use MeSH?**

- A single word can have significantly different meanings
- Concepts can have a multitude of synonyms
- General concepts are associated with a variety of specific concepts

The word “Jaguar” can refer to:

- A large cat

[Image: https://commons.wikimedia.org/wiki/File:Amur_leopard01_960.jpg]
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- A car company
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- Mac OS X 10.2

https://commons.wikimedia.org/wiki/File:Amur_leopard01_960.jpg
https://commons.wikimedia.org/wiki/File:Jaguar_E-Type_Coupe_Series_1_(1967)__15149313858.jpg
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The word “Jaguar” can refer to:

- A large cat
- A car company
- Mac OS X 10.2
- An NFL team
Why do we need to use MeSH?

- A single concept can also be referred to by a multitude of synonyms
- Consider the following drugs:
  - Tylenol
Why do we need to use MeSH?

• A single concept can also be referred to by a multitude of synonyms

• Consider the following drugs:
  – Tylenol
  – Panadol
Why do we need to use MeSH?

• A single concept can also be referred to by a multitude of synonyms
• Consider the following drugs:
  – Tylenol
  – Panadol
  – APAP
Why do we need to use MeSH?

• A single concept can also be referred to by a multitude of synonyms

• Consider the following drugs:
  – Tylenol
  – Panadol
  – APAP
  – Paracetamol
Why do we need to use MeSH?

- A single concept can also be referred to by a multitude of synonyms

- Consider the following drugs:
  - Tylenol
  - Panadol
  - APAP
  - Paracetamol
  - Acetaminophen
Why do we need to use MeSH?

• A single concept can also be referred to by a multitude of synonyms

• Consider the following drugs:
  – Tylenol
  – Panadol
  – APAP
  – Paracetamol
  – Acetaminophen = MeSH term
Why do we need to use MeSH?

• General concepts are associated with a variety of more specific concepts

• Consider the relationship between the following conditions:
  – Cardiovascular Disease
  – Heart Disease
  – Cardiac Arrhythmia
  – Tachycardia
  – Ventricular Tachycardia
  – Torsades de Pointes
Why do we need to use MeSH?

• General concepts are associated with a variety of more specific concepts

• Consider the relationship between the following conditions:

  > Cardiovascular Disease
    > Heart Disease
      > Cardiac Arrhythmia
        > Tachycardia
          > Ventricular Tachycardia
            > Torsades de Pointes
Why do we need to use MeSH?

• General concepts are associated with a variety of more specific concepts

• Consider the relationship between the following conditions:

• MeSH uses Tree Structures to organize related concepts into hierarchies to allow us to see everything related to a concept.
Why do we need to use MeSH?

- General concepts are associated with a variety of specific concepts
- MeSH Tree Structures can be used to search for everything related to a general concept

All MeSH Categories
  Diseases Category
    Cardiovascular Diseases
      Heart Diseases
        Arrhythmias, Cardiac
          Tachycardia
            Tachycardia, Paroxysmal
            Tachycardia, Reciprocating
              Tachycardia, Atrioventricular Nodal Reentry
              Tachycardia, Sinoatrial Nodal Reentry
            Tachycardia, Supraventricular
              Tachycardia, Ectopic Atrial
              Tachycardia, Ectopic Junctional
              Tachycardia, Sinus
            Tachycardia, Ventricular
              Accelerated Idioventricular Rhythm
              Torsades de Pointes