Searching Effectively & Efficiently

Techniques you can use to enhance your literature searching skills

DATE: October 4, 2024   PRESENTED BY:ANDREW HAMILTON, OHSU Health Science Education & Research Librarian

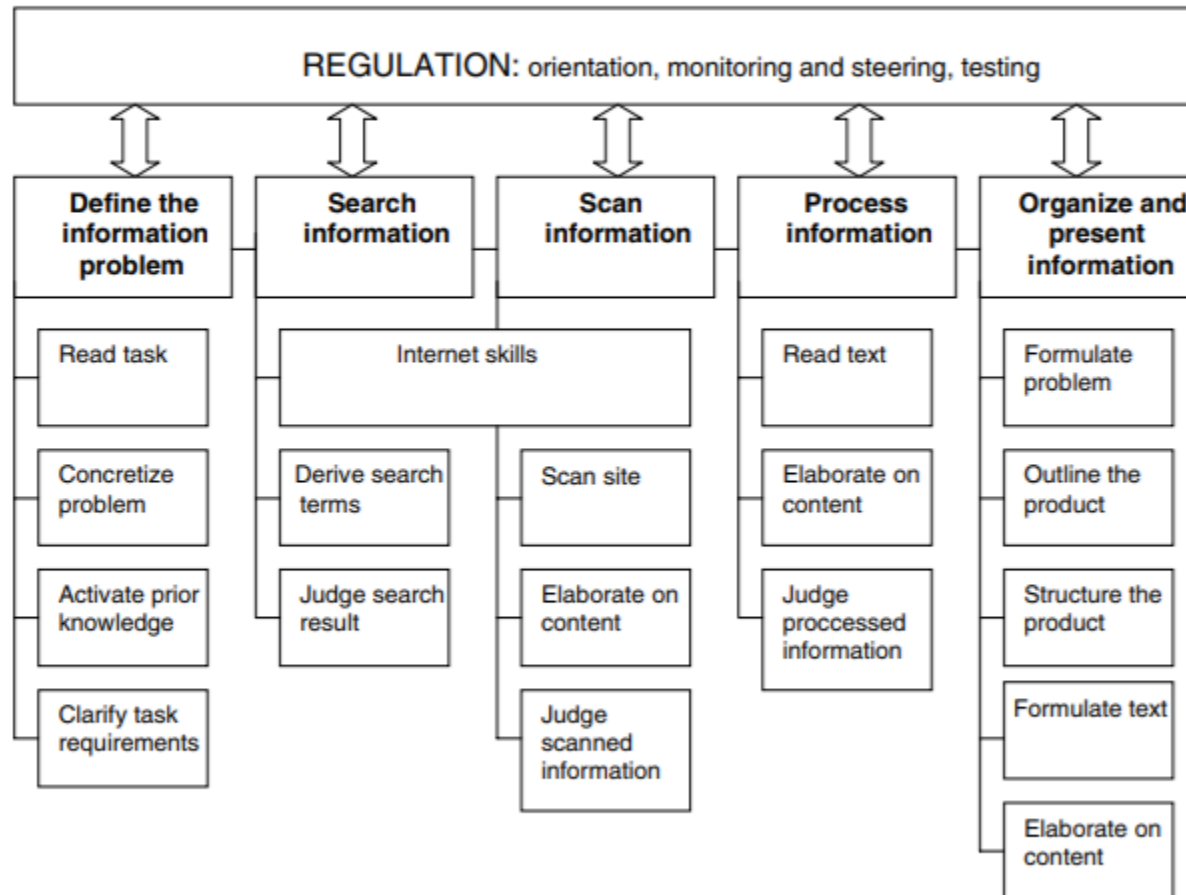# Many skills are required to conduct an effective literature search

Fig. 2. Skill decomposition of the information problem-solving skill.

Many skills are required to conduct an effective literature search
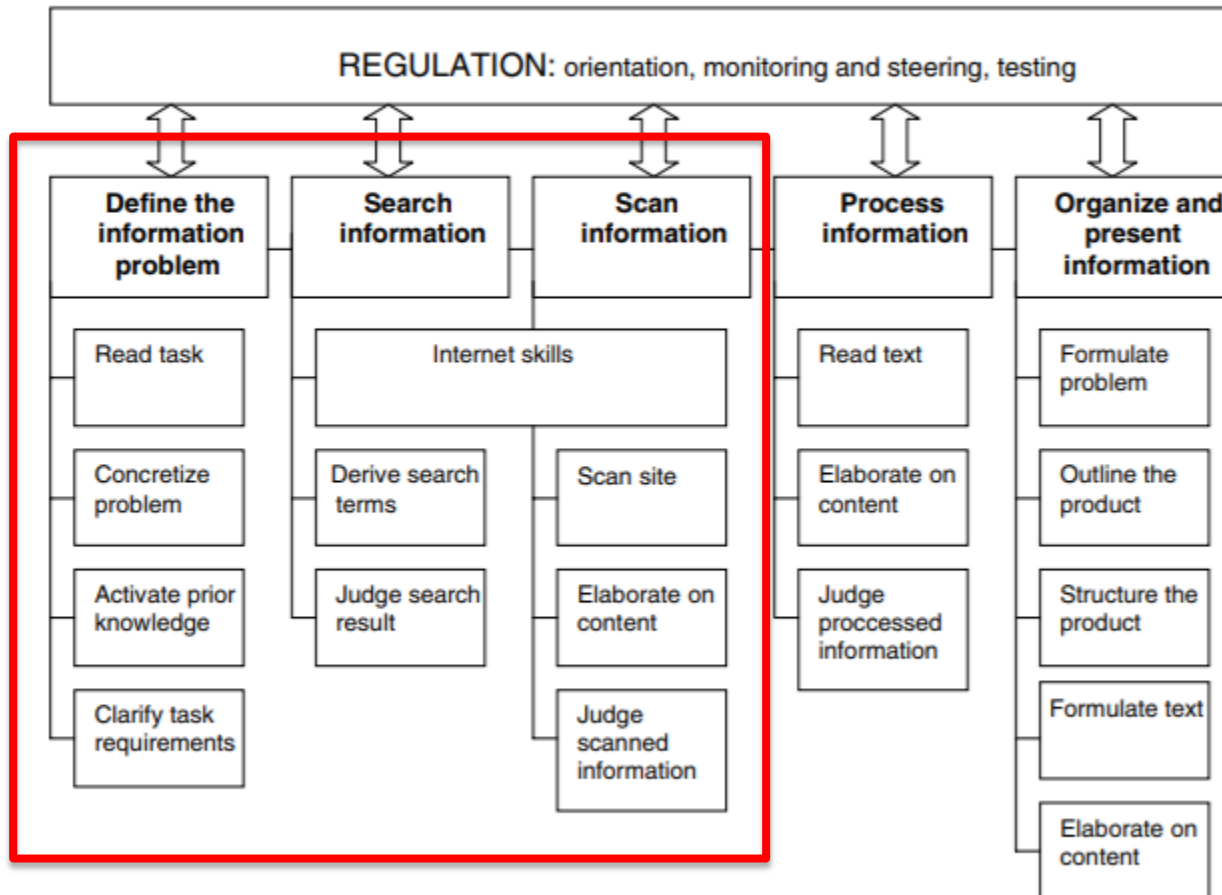
Fig. 2. Skill decomposition of the information problem-solving skill.

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

4
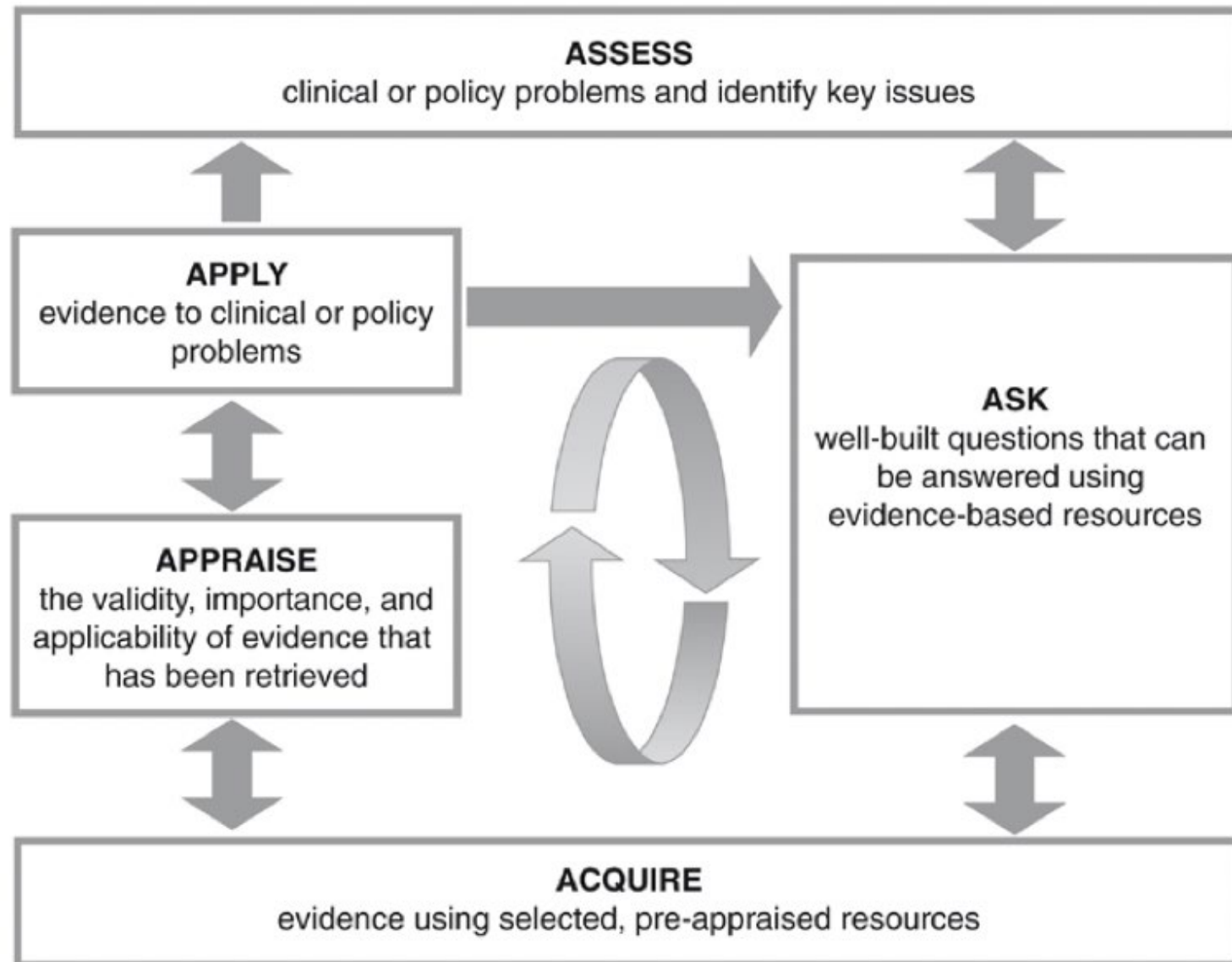
Types of Questions: Background vs Foreground

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
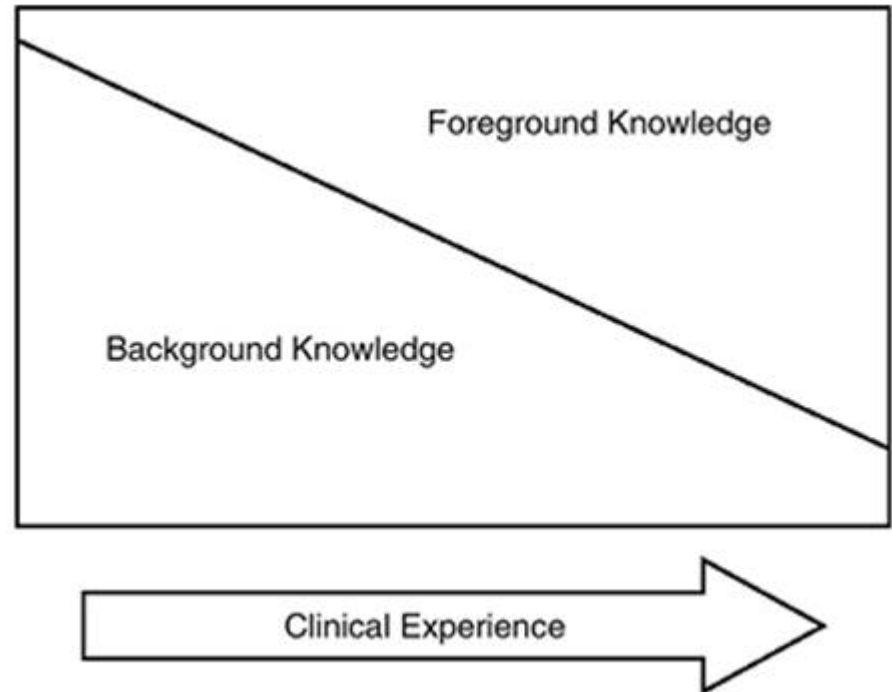
Identifying searchable terms

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

- PICO

  - Patient-Problem-Population
  - Intervention
  - Comparison
  - Outcome

- Who, What, Where, When, How, & Why.

The PICO Method:
A system to help you frame your question into individual search concepts

Presented by: Andrew Hamilton

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?

OHSU

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?

OHSU

PICO Method – Comparison

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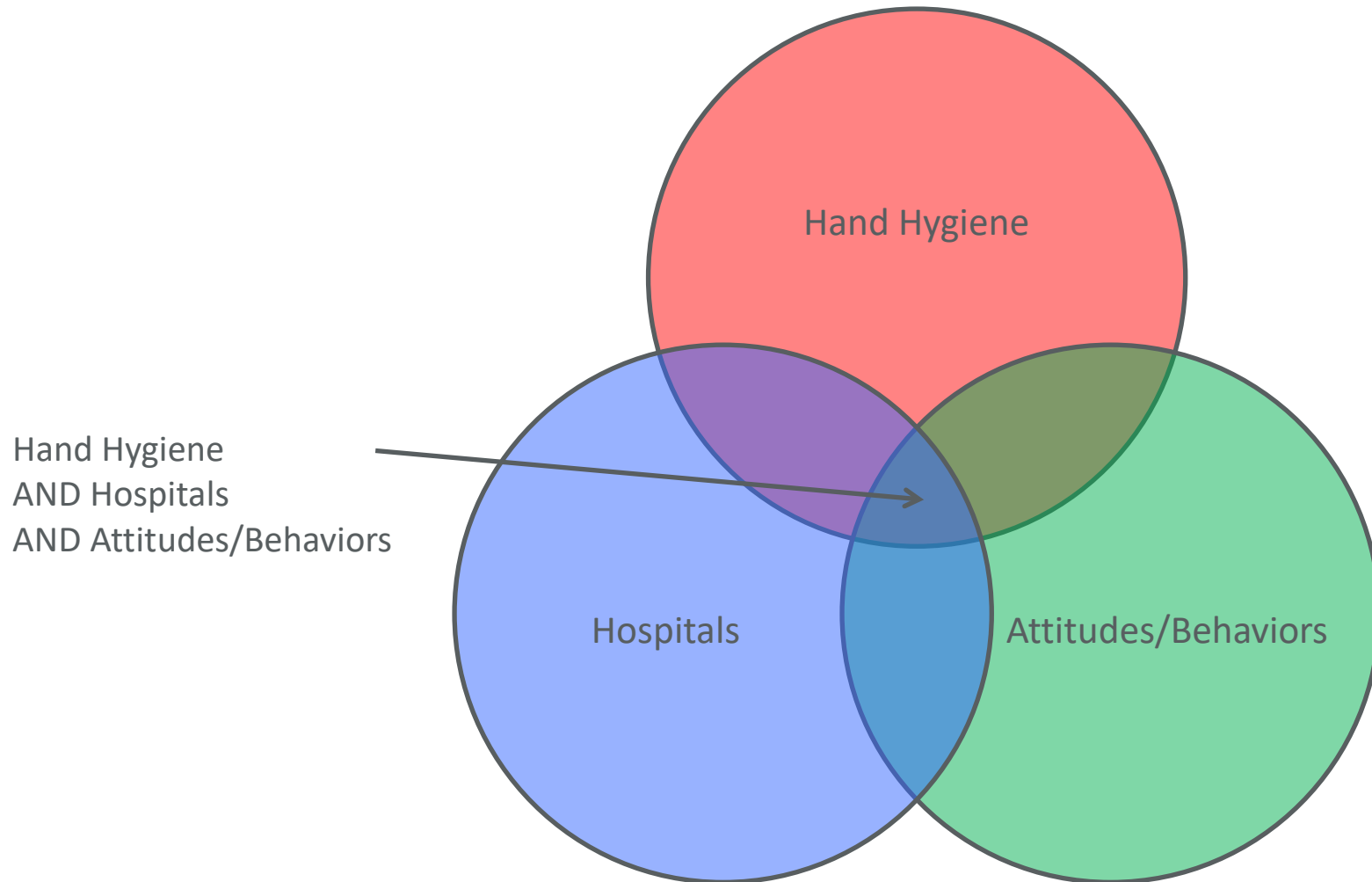   - What else could be done?

OHSU

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?

OHSU

PICO(T) Bonus 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 - Putting it all together

Hand Hygiene

Hand Hygiene
AND Hospitals
AND Attitudes/Behaviors

Hospitals

Attitudes/Behaviors

OHSU

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.

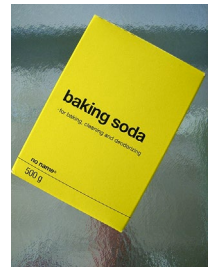I will need to get the following ingredients to make these cookies:

- 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:
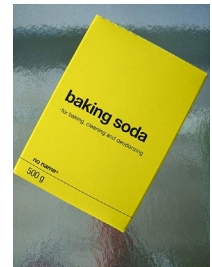
- Flour
- Sugar

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:
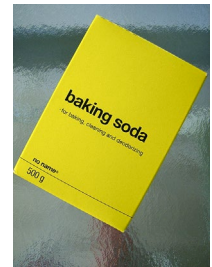
- Flour
- Sugar
- Brown Sugar

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
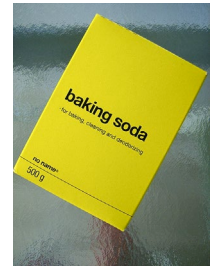- Sugar
- Brown Sugar
- Baking Soda

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

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
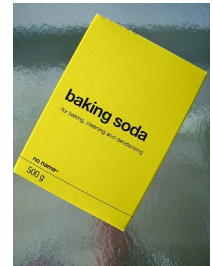- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips

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
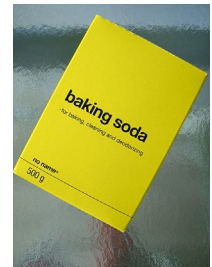 - Semi-sweet? Dark? Milk? White?
  - Chips? Chunks? Mini-chips?

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
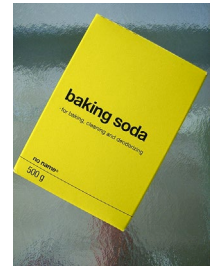- Chocolate Chips
- Vanilla?

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
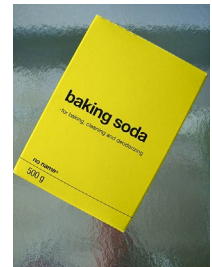- Chocolate Chips
- Vanilla extract

OHSU

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?

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
- Chicken Eggs

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
- Chicken Eggs
- Butter
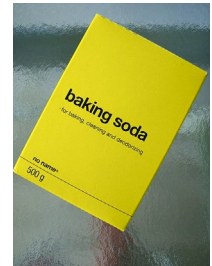
Structuring your search terms

Literature searching works the same way – You need to take your question and break it down to identify the searchable elements in it:

"Drug Therapy of HIV infection in Prisons in the United States"

We can find information on this topic by using the following concepts to construct a literature search strategy.

- **HIV Infection**
  AND
- **Drug therapy**
  AND
- **Prisons**
  AND
- **United States**

DOWN & OUT searching

First go DOWN separating out the individual concepts in the question that will be ANDed together

OHSU

Structuring your search terms

Literature searching works the same way – You need to take your question and break it down (use PICO) to identify the searchable elements in it:

"Drug Therapy of HIV infection in Prisons in the United States"

We can find information on this topic by using the following concepts to construct a literature search strategy.

- **HIV Infection OR HIV**

   AND

- **Drug therapy OR Pharmacotherapy OR HAART OR Anti-retroviral therapy…**

   AND

- **Prisons OR Prisoners OR Incarceration**

   AND

- **United States**

...and then go OUT with synonyms of each concept that will be ORed together

What is MeSH?

MeSH Vocabulary tutorial
https://www.nlm.nih.gov/bsd/disted/video/

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
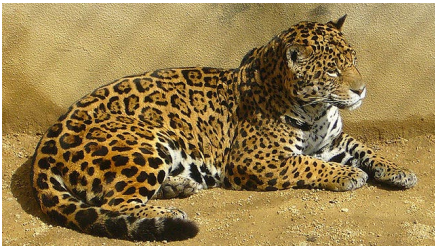- General concepts are associated with a variety of specific concepts

The word "Jaguar" can refer to:

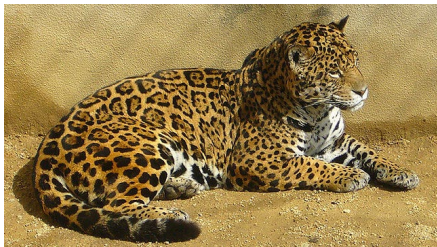# Why do we need to use MeSH?

- 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

OHSU

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
- A car company

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
- A car company
- Mac OS X 10.2

OHSU

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
- A car company
- Mac OS X 10.2
- An NFL team
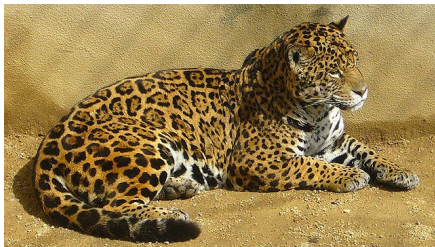
OHSU

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

MeSH HEADINGS

Entry Terms map synonymous concepts to preferred MeSH term.
MeSH Vocabulary tutorial -- https://www.nlm.nih.gov/bsd/disted/video/

Myocardial Infarction

NECROSIS of the MYOCARDIUM caused by an obstruction of the blood supply to the heart (CORONARY CIRCULATION).
Year introduced: 1979

Entry Terms:

- Infarction, Myocardial
- Infarctions, Myocardial
- Myocardial Infarctions
- Cardiovascular Stroke
- Cardiovascular Strokes
- Stroke, Cardiovascular
- Strokes, Cardiovascular
- Heart Attack
- Heart Attacks
- Myocardial Infarct
- Infarct, Myocardial
- Infarcts, Myocardial
- Myocardial Infarcts

PubMed will add the preferred MeSH term to any search on a MeSH entry term. (e.g. Heart Attack >> Myocardial Infarction)

PubMed.gov
US National Library of Medicine
National Institutes of Health

PubMed | heart attack | Search
Advanced

Search Details

Query Translation:

"myocardial infarction"[MeSH Terms] OR ("myocardial"[All Fields] AND "infarction"[All Fields]) OR "myocardial infarction"[All Fields] OR ("heart"[All Fields] AND "attack"[All Fields]) OR "heart attack"[All Fields]

Search | URL

Result:

222649

MeSH HEADINGS

MeSH Lookup Tools

PubMed MeSH Browser: https://www.ncbi.nlm.nih.gov/mesh/

MeSH HEADINGS

Hierarchical organization groups terms by content.

MeSH Vocabulary tutorial -- https://www.nlm.nih.gov/bsd/disted/video/

All MeSH Categories
    Diseases Category
        Cardiovascular Diseases
            Heart Diseases
                Myocardial Ischemia

Broader terms above term in MeSH tree

Myocardial Infarction
  Anterior Wall Myocardial Infarction
  Inferior Wall Myocardial Infarction
  Non-ST Elevated Myocardial Infarction
  Shock, Cardiogenic
  ST Elevation Myocardial Infarction

All MeSH Categories
    Diseases Category
        Cardiovascular Diseases
            Vascular Diseases
                Myocardial Ischemia

Myocardial Infarction

Narrower terms nested below term in MeSH tree – Included in "exploded" search of MeSH term

  Anterior Wall Myocardial Infarction
  Inferior Wall Myocardial Infarction
  No-Reflow Phenomenon
  Non-ST Elevated Myocardial Infarction
  Shock, Cardiogenic
  ST Elevation Myocardial Infarction

OHSU