# A Very Small Introduction to Research Methods (Day 3)

Prepared for the Brilliant
Fourth Year FRMS Students

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# Literature Review

# Why Review the Literature?

1) What's been done so far

- Should provide you with the following:

  – The latest trends in your topic
  – Available databases that you can think about using
  – Any gaps that you may answer
  – A concept for how you will answer your question

## 2) Level of Existing Knowledge and theory

- Determine the level of knowledge

  - Descriptive

  - Explanatory

  - Predictive

- How knowledge is generated

- The methodology applied to gather data

- Boundaries of the study being reviewed

- How relevant to your topic

## 3) Relevance and rational to your investigation

- A will written lit review should

- Very good story, that…

- Flows directly into your research plan, and…

- Supports your choice of topic due to its relevance and choice of study design due to its innovation

# How to Conduct a Lit Review

- **When?**
  - Start early to get an idea or to fine tune one that you already have.
  - Keep searching while conducting research
  - In case using databases and previous results it can be part of your results
  - And always remember, three months in the lab will save you one hour in the library.

# What?

- Databases: Good to direct your thought, find gaps and can be used as part of the results
- Journals: Latest work and techniques
- Books: Basic fundamental concepts

# How?

- **Set Parameters**
  - Your topic
  - Related topics
  - Related methods
  - Start from a central point and branch off
  - Use good keywords

# Organization makes a world of difference

- You are not going to read everything at first
- Abstract:
    - directly related: good for latest findings
    - Indirectly related: good for techniques, approach, sitting
- Take short notes to remind yourself what's useful in that paper
- Highlight key points
- Periodically skim over the papers you thought useful.
- Learn the names of the authors

# Evaluate the paper critically

- Be as harsh as you want
- Ask your advisor if you are correct in your evaluation
- When possible, contact the author

# Write up

- Start with an outline
- Specific points
- Smooth flow
- Fill in the large details then smaller and smaller..

# Efficient PubMed Search

# Learning Outcomes

By the end of this session, the participant will be able to:

- Employ the PICO approach for searching a topic
- Use MeSH to search the literature for a topic
- Employ Boolean operators to narrow down a search in PubMed
- Use "truncation", "quotation", and "parentheses" to aid in literature search in PubMed
- Use the "advanced" search option in PubMed
- Employ filters to refine literature search
- Retrieve articles from the Saudi Digital Library

# How do I start

# PICO

- Focus on most important issues and outcomes
- Used to identify key terms for search

| P | I | C | O |
|---|---|---|---|
| Problem Population | Intervention | Comparison | Outcome |
| What is the problem in question?<br><br>Who is my subject? | Am I exposing them to something?<br><br>Am I looking for something in them? | Who are they going to be compared with?<br>Controls? | What did it affect? |

- **P**atient (Problem)
  - Patient or problem (patient population – such as COPD, CHF, Sickle Cell Anemia, asthma)

- **I**ntervention
  - What are you considering (a medication, diagnostic test, gene, mutation)?

- **C**omparison
  - What are your alternatives, if any? A different drug or therapy? No treatment? Different gene than normal?
  - A comparison <span style="color:red">may not</span> be required for your question

- **O**utcome
  - What outcome are you hoping for?
  - Decreased symptoms, improved test results, improved function, etc.?

# Current example

P: PTH measurements

I: tube type

C: effects of additives on the stability of PTH (compared at different tubes)

O: Identify the best tubes to draw for PTH

# Exercise 1

Identify PICO for your research

P:

I:

C:

O:

# Boolean Operators

- AND
  - Myeloid AND PKI
- OR
  - Duchanne OR Becker Muscular Dystrophy
- NOT
  - Muscular dystrophy NOT Becker

# Database Search tricks

- Best match sort order
- Truncation: using * at the end of the word
  - Incubat* = incubate, incubation, incubating, incubated
- Quotation: using " " to specify a term
  - "Acute Myeloid Leukemia"
- Parentheses: executing a command inside the paranthases before outside (similar to math)
  - Leukemia AND (myeloid OR lymphoid) similar to $3 \times (3+5)$

# English vs. American English

- **Leukemia vs. Leukaemia**
  - Use OR
- "Similar articles" suggestion
  - Great for early exploration of the literature

# Exercise 2

Use PICO to plug in a search engines