How to Address a Research Question and Carry Out a Medical Literature Review

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Learning Objectives

By the end of this session, students will have the skills to:

- structure a research question within the PICO framework.
- identify relevant search terms and search concepts for advanced searching in PubMed, Scopus, and Google Scholar.
- access journal articles and other library online restricted resources remotely via the VPN software.
- use the “UC-eLinks Request It” to obtain items that are not available from the UCI Libraries
A Literature Review

Surveys, summarizes, and links information about a given topic:

- Can offer an overview of what has already been done in a specific research topic;
- Provides summaries of recent literature;
- Evaluates the results of previous primary research;
- Can lead to a deep understanding of the subject with a timely literature review;
- Often widely read.
Types of Literature Reviews

There are at least 14 different types of reviews:

- Mini vs. Long Reviews
  - Descriptive vs. Integrative
  - Narrative vs. Systematic
Types of Literature Reviews (Cont’d)

Traditional or Narrative Literature Review (mini-, descriptive)
- Can summarize and make comments about a collection of studies;
- Draws conclusion about the topic;
- Identifies gaps or inconsistencies in a body of knowledge;
- Cannot provide the type of quantitative synthesis of the literature that systematic review provides, e.g., editorials, commentaries, overview or critical review articles.

Systematic Review
- More rigorous, comprehensive, and well-defined approach;
- Includes published and unpublished studies relating to a particular subject area;
- Details the time frame within which the literature was selected;
- Details the methods used to evaluate and synthesize findings of the studies in question.
Interpretation of Systematic Reviews

**Meta-analysis** (quantitative analysis)
- Includes statistical power calculations;
- Takes findings from included studies on the same subject and analyzes them using standardized statistical procedures;
- Integrates findings from a large body of quantitative findings to enhance understanding;
- Draws conclusions and detects patterns and relationships.

**Meta-synthesis** (qualitative analysis)
- Non-statistical technique;
- Integrates, evaluates and interprets findings of multiple qualitative research studies to identify common core elements and themes;
- May use findings from phenomenological, grounded theory or ethnographic studies;
- Involves analyzing and synthesizing key elements;
- Goal: transform individual findings into new conceptualizations and interpretations.
Contents of Narrative Literature Reviews for Peer-Reviewed Journals

1. Title
2. Structured abstract
3. Introduction
4. Methods
5. Discussion
6. Conclusion
7. Acknowledgment if applicable
8. References
9. Table
10. Figures
11. Figure captions

Ref:
https://familymedicine.med.wayne.edu/mph/project/green_2006_narrative_literature_reviews.pdf
<table>
<thead>
<tr>
<th>Title</th>
<th>Methods</th>
<th>Discussion</th>
<th>Funding</th>
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<tbody>
<tr>
<td>5. Protocol and registration</td>
<td>16. Additional analyses</td>
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<td>6. Eligibility criteria</td>
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<td>7. Information sources</td>
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<td>8. Search</td>
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<td>9. Study selection</td>
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<tr>
<td>10. Data collection process</td>
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<tr>
<td>11. Data items</td>
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<tr>
<td>12. Risk of Bias in individual studies</td>
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The Literature Review Process

1. Define a Topic and Audience that is:
   - feasible, interesting, novel, ethical, and relevant
   - an important aspect of the field, and
   - a well-defined, researchable issue

2. Research the literature effectively:
   - Define the aim and objectives and identify inclusion & exclusion criteria
   - Search the literature for pertinent papers and reviews:
   - Identify the need for a review and determine if someone has already published a similar review.
   - Choose the type of review you wish to write (descriptive vs. integrative).
3. Organize and screen results
   - Use a citation management software (EndNote X9, Mendeley, Papers 3, etc.) to record, screen, and organize your collection.
   - Survey the literature and take notes while reading each paper.

4. Critique the literature - be critical and consistent
   - Assess study quality, identify the methodological problems, point out research gaps
     - Appraise/grade studies and extract data
     - Synthesize data (meta-analysis or meta-synthesis)
   - A reader should have a rough idea of:
     - the major achievements in the reviewed field
     - the main area of debate, and
     - the outstanding research questions.
The Literature Review Process (Cont’d)

5. Write the review
   - Keep the review focused, but make it of broad interest
   - Find a logical structure, e.g., PRISMA checklist for systematic reviews and meta-analysis
   - Make use of feedback
   - Include your own relevant research, but be objective
   - Be up-to-date, but do not forget older studies

6. Submit your findings for publication
   - Consider submitting to a OA journal
   - Be aware of predatory journals
Structure a Well-Built Researchable Question

The **PICO** framework

- **P** – Patients or Population AND Problem

- **I** – Intervention: *a treatment, a diagnostic test, or an exposure (to a known or presumed risk factor, etc.)*

- **C** – Comparison: *a standard or alternate treatment, placebo, gold standard diagnostic test, absence of risk factor, etc.*

- **O** – Outcome of interest

The **PICO** terms come from and **should match** your clinical question.
A Well-Defined, Researchable Topic in Prevention

What are the clinical and economic benefits of increasing access to reproductive health services and supplies for women with substance abuse disorders?

P = Reproductive age females with substance abuse disorders

I = Contraceptive care & services (family planning program, counseling, contraceptive supplies, patient education programs, etc.)

C = Unmet needs for contraception or reproductive health

O = Socioeconomic factors (e.g., reduce health care cost, unintended pregnancy, HIV infections, abortion rates, etc.)
Research Question

In females diagnosed with breast cancer suitable for breast conserving surgery, what is the efficacy and safety of partial breast irradiation as compared to whole-breast irradiation?

P = females diagnosed with breast cancer suitable for breast conserving surgery

I = partial breast irradiation

C = whole-breast irradiation

O = efficacy and safety
A Well-Defined, Researchable Topic in Diagnosis

Research Question:

What is the accuracy and safety of percutaneous image-guided needle biopsy of renal masses?

P = Patients with suspected renal malignancy
I = Image-guided needle biopsy
C = Nephrectomy
O = Safety, sensitivity and specificity
Research Question:

Among young children with asthma, is living in a passive smoking environment an important factor in predicting frequency of asthma attack compared to a smoke-free environment?

P = Young children with asthma
I = Passive smoking environment
C = Smoke-free environment
O = Predicting frequency of asthma attack
A Researchable Topic in Etiology/Harm

Research Question:

Does the use of deep suction vs. nasal suction increase the length of stay in hospitalized children with bronchiolitis?

P = Hospitalized children with bronchiolitis or RSV
I = Deep suction
C = Nasal suction or No suction
O = increase the length of stay
Determine the Inclusion & Exclusion Criteria

Before the literature search, determine:

- **Inclusion criteria**
  - Homeless females or prostitutes
  - Participant Characteristics: Age 13-44 who are sexually active. Needle exchange users, homeless, poverty, etc.
  - Publication dates and types: Studies published since the year of 2000; RCTs, Cohort, Prospective and Retrospective studies.
  - Languages: English studies
  - Database selection: PubMed, Scopus, CINAHL, ClinicalTrial.gov, etc.

- **Exclusion criteria**
  - Publication prior to 2000, non-English studies, case reports.
  - Non-substance abuse users, prescription drug misuse, etc.
Search Strategy

1. substance-related disorders OR substance abuse OR drug abuse OR drug dependence OR addiction OR drug use disorders OR substance dependence OR drug abusers

2. contraceptives OR contraceptive agents OR contraceptive OR contraceptive devices OR contraception OR birth control

3. health services needs and demand OR needs assessment OR reproductive health services OR rewards OR incentive OR incentives OR family planning services OR family planning OR mobile health units OR mobile clinic OR self-help OR community-institutional relations groups OR community outreach OR counseling OR patient education as topic OR need assessment

4. #1 AND #2 AND #3 Filters: Publication date from 2000/01/01; English
**Asking a Clinical Question and Conducting a PubMed Search Worksheet**

https://guides.lib.uci.edu/ld.php?content_id=47919129

### Section I: Asking the Clinical Question

1. Briefly Describe Your Clinical Case Scenario.

2. Construct a Well-Built, Patient-Oriented Clinical Question in a PICO Framework Derived from Your Case

<table>
<thead>
<tr>
<th>Question Components</th>
<th>Your Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P</strong> - Patient or Population</td>
<td>Describe the most important characteristics of the patient (e.g., age, disease/condition, gender)</td>
</tr>
<tr>
<td><strong>I</strong> - Intervention; Prognostic Factor; Exposure</td>
<td>Describe the main intervention (e.g., drug or other treatment, diagnostic/screening test, harmful exposure)</td>
</tr>
<tr>
<td><strong>C</strong> - Comparison (if appropriate)</td>
<td>Describe the main alternative being considered (e.g., placebo/no treatment, standard therapy, diagnostic gold standard)</td>
</tr>
<tr>
<td><strong>O</strong> - Outcome</td>
<td>Describe what you’re trying to accomplish, measure, improve, or affect (e.g., mortality or morbidity, accurate and timely diagnosis, improved quality of life)</td>
</tr>
</tbody>
</table>

3. Enter Your Well-Built Clinical Question (in sentence format) containing the PICO Elements.

### Section II: Finding the Evidence, Turning Search Terms into a PubMed Search Strategy

5. Search Strategy Development - Identify terms to fit your PICO question

<table>
<thead>
<tr>
<th>Primary search term</th>
<th>Synonym 1</th>
<th>Synonym 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td></td>
<td></td>
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<tr>
<td>I</td>
<td></td>
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<td>C</td>
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<tr>
<td>O</td>
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</tbody>
</table>

6. Provide Your PubMed Search Strategy

Your tasks for PubMed:

a) Conduct your search in PubMed (use the search terms and search concepts above)

b) Apply additional PubMed Filters to your search results. For example: ‘Article types - Clinical Trial’, ‘Publication Dates - Last 10 years’, ‘Language - English’, etc.

c) Review the PubMed search results. If you are satisfied, follow the steps below:

   - Click on Advanced (located under the PubMed search box)
   - Copy and paste the search strategy from the PubMed History section of the PubMed Advanced Search Builder to the space below.

   **Note:** DO NOT copy the search strategy from the PubMed “Search details”.

7. Identify up to three recent and relevant clinical studies from your search results. Copy and paste the relevant citation(s) to the space below.
<table>
<thead>
<tr>
<th>Access &amp; Owner</th>
<th>PubMed</th>
<th>Scopus</th>
<th>Google Scholar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Free, access thru PubMed@UCI; developed &amp; maintained by NLM</td>
<td>Fee based. Subscribed by the UCI Libraries; owned by Elsevier</td>
<td>Free; owned by Google</td>
</tr>
<tr>
<td>Subject Field</td>
<td>Biomedical &amp; Life Sciences</td>
<td>Multi-subject disciplines including EMBase, physical sciences, engineering, social sciences, art and humanities.</td>
<td>Multi-subject disciplines. May find articles that are not in PubMed or Scopus.</td>
</tr>
<tr>
<td>Journals Indexed</td>
<td>30,000 record titles are included in the PubMed journal list</td>
<td>36,000 titles from over 5,000 publishers</td>
<td>Covers whatever access is allowed by the publishers, prof societies, and university repositories – not necessary comprehensive.</td>
</tr>
<tr>
<td>Period Covered</td>
<td>1781 - present</td>
<td>1966 – Present</td>
<td>Unknown. Covers whatever access to the servers is allowed. Results are sorted by relevance, not by date. Only shows up to 1,000 results for any particular search query.</td>
</tr>
<tr>
<td>Content types</td>
<td>Citations, abstracts and a few selected book chapters.</td>
<td>Citations, abstracts, eBooks, patents</td>
<td>Theses, books, book chapters, journal &amp; conference abstracts, technical reports, etc.</td>
</tr>
<tr>
<td>Descriptors</td>
<td>28,472 (MESH)</td>
<td>Title, Keyword search</td>
<td>None, search features are limited.</td>
</tr>
<tr>
<td>Full-Text</td>
<td>PubMed@UCI via UC-eLinks</td>
<td>Via UC-eLinks</td>
<td>UC-eLinks or PDF links</td>
</tr>
</tbody>
</table>
Why Use a Citation Manager?

- Helps ease the process of collecting references, finding full-text, writing, and preparing a paper for class assignment or publication.

- Direct import, store, and manage search results (books, articles, reports, newsletter articles, etc.) from different databases and websites.

- Identify and remove duplicates from multiple database search results.

- Automatically find full-text; Configure the citation manager to retrieve full text by using the following OpenURL resolver: [https://ucelinks.cdlib.org:8888/sfx_local](https://ucelinks.cdlib.org:8888/sfx_local).

- Can add notes and highlights on pdfs and save them in your collection of citations.

- Enables you to insert in-text citations in a Word document while simultaneously creating a bibliography for a manuscript you are writing.

- Allows you to share references in a library/database and collaborate on research papers/projects.
Send the PubMed search results to Citation Manager (e.g., EndNote)

1. Click the “Send to” pull-down.

2. Select “Citation Manager”. PubMed will automatically send the first 200 references including the abstracts to your bibliographic manager software.

3. To send the next set of reference, enter 201 in the “Start from citation” box.

**Note:** NLM will release and replace the current version of PubMed with a mobile friendly interface this fall. The old PubMed will only be available until the end of this year (Dec 2019).
In the Scopus results page, click one or more items or "All" to activate the "Export" option.
1. On the search results page, mark some or all references.

2. Click Export

3. "On the next page, be sure to check the PubMed ID, Abbreviated source title, Abstract, and Index keywords fields."

4. Click Export.
allintitle: (substance OR drug) (abuse OR users OR disorders OR disorder) (contraceptive OR contraception OR contraceptives)
Google Scholar settings:

For UC-eLinks


2. Search for these two links:
   - University of California, Irvine - UC-eLinks
   - Open WorldCat - Library Search

3. Set results per page to 20.

4. Choose to show library access links.

5. Save settings.

For Bibliography Manager

1. Set results per page to 20 (Google's default: 10 results provides the fastest results).

2. Choose to show links to import citations.

3. Select from BibTeX, EndNote, RefMan, RefWorks, etc.

4. Save settings.

5. To retain settings, turn on cookies.
Identification of Included Studies

Apply inclusion and exclusion criteria to each reference

1. After the duplicates are removed, screen the titles and abstracts for potentially relevant papers.

2. Use the “Find Full Text” or “Get Full Text” feature to obtain articles of potentially eligible studies. If not available online or in print, submit an Interlibrary Loan via “UC-eLinks Request It.”

3. Check bibliographies of included papers (hand search).

4. Check cited references of included papers

5. Unpublished data, e.g., lab data, consult experts in the field, unpublished clinical trials, etc.
Interlibrary Loan via UC-eLinks Request It

1. When full-text access is not available in PubMed, Google Scholar, or other databases, select “Request this from the library”

2. Complete the Request online form with your Library card number, Name, Dept., UCI email address, and deliver location.

3. In most cases you will receive an email within a few days with instructions on how to retrieve the article from your MyILL account.

Note: Due to an inability to come to an agreement with Elsevier, UC does not currently have access to any Elsevier journals that were published since January 2019. You can request these articles via UC-eLinks Request It.
Remote Access to UCI Libraries Online

Restricted Resources: The link is now https://www.oit.uci.edu/help/vpn/

Virtual Private Network (VPN)

Summary: If you need to connect to UCI Net from off campus, Virtual Private Network (VPN) may be the solution for you. VPN allows you to connect to on campus-only resources like the Library and encrypts the information you are sending over the network, protecting your data.

Peer-to-peer file sharing services and other high-bandwidth applications should not be used while using the VPN service. You may be automatically blocked from using the VPN if your bandwidth exceeds the maximum bandwidth limit.

3 Ways to Access the VPN

1. WebVPN
2. VPN Software
3. iOS, Android OS, Chrome OS VPN

3 Ways to Access the VPN Software Versions

- iOS – iPhone, iPod Touch, iPad
- Android 4.x
- Chrome OS – ChromeBook

Need Help

- Call Us – (949) 824-2222
- Email Us – oit@uci.edu
- Self Service
- Help Desk
- Knowledgebase
VPN Software Download, Install, and Configure

- For Mac: [https://uci.servicenow.com/kb_view.do?sysparm_article=KB0010200](https://uci.servicenow.com/kb_view.do?sysparm_article=KB0010200)
- For Windows: [https://uci.servicenow.com/kb_view.do?sysparm_article=KB0010199](https://uci.servicenow.com/kb_view.do?sysparm_article=KB0010199)
- In the Ready Connect box, enter: `vpn.uci.edu` in the Ready to Connect
- from the Group drop-down menu, must select **UCIFULL**
Summary

- Determine the type of literature review you want to conduct.
- Structure a researchable question within the PICO framework.
- Must use a citation manager to collect, organize, and engage with your research writing process.
- Setup your VPN software for remote access to library databases and finding full-text documents.
- Take advantage of the free, easy, and quick Interlibrary loan service for items that are not available from the UCI Libraries via UC-eLinks Request It.
- Feel free to contact your Health Sciences Librarians for any library service or research related questions.
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Feel free to contact your medical librarians anytime!