Searching the Medical Literature for Evidence-Based Practice

ACH Research Course

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Library Information and Access

- Health Sciences Library opening hours are Monday-Friday: 8:30 to 6PM; Saturday: 12-4PM.
- Students can email Diane at: dllorenz@ucalgary.ca to book a consultation appointment to discuss their review.
- Facility and service hours updates can be found at: library.ucalgary.ca/hsl
- Group workrooms can be booked online at: Library | University of Calgary - Library at University of Calgary (ucalgary.ca).
- Access to our physical collections is currently restricted. Items can be requested online, by the searching the library’s catalogue, and email notifications will be sent out when these are available for pickup at the Health Sciences Library.
Learning Outcomes

By the end of this session, attendees should be able to:

• Understand the differences between types of literature reviews.
• Identify appropriate library resources to answer a clinical question and conduct a literature review
• Recall the steps in developing a structured literature review
• Recall strategies for searching Ovid MEDLINE
Rate Yourself!

1. How to navigate the library website
2. How to place an interlibrary loan
3. Where to find evidence for a clinical care question
4. Where to find evidence for a research question
5. When comprehensive searching is required
6. What steps are involved in the systematic review process
7. How to convert your research topic into a literature search
8. How to comprehensively search a database (using both keywords and subject headings)
Searching for an Article or Book

Enter title of article or book

*Management of Pediatric Trauma*

library.ucalgary.ca/hsl
Interlibrary Loan

- For use when article or book is not available through the library catalogue
- Located at https://library.ucalgary.ca/interlibrary/
- Turnaround time for article requests is typically 1-2 business days
- A current Unicard is required to place interlibrary loan requests
Identifying Sources of Evidence
Identifying Resources to Answer Clinical Care Questions

- AccessMedicine
- ClinicalKey
- DynaMed Plus

- RxTx
- VisualDx
What are the physical manifestations of Fetal Alcohol Spectrum Disorder?
Identifying Resources to Conduct Research

- Research databases
- Reference list searching
- “Cited by” reference searching
- Contacting experts regarding research in progress
- Published relevant systematic reviews
- Grey literature
Identifying Resources to Conduct Research

- MEDLINE (Ovid)
- EMBASE (Ovid)
- Cochrane CENTRAL (Ovid)
- Cochrane Database of Systematic Reviews (Ovid)
- CINAHL (EBSCO)
- APA PsycInfo (Ovid)
- Scopus (Elsevier)
- Web of Science (Clarivate)
Identifying Resources to Conduct Research

MEDLINE (Ovid)
- Key medical database
- Well-organized subject heading structure to facilitate searching

EMBASE (Ovid)
- Key medical database
- International in focus
- Strength in pharmacology

Cochrane CENTRAL (Ovid)
- References to over 300,000 randomized controlled trials in health care
Identifying Resources to Conduct Research

- Cochrane Database of Systematic Reviews (Ovid)
  - Includes systematic reviews and protocols
  - Check to see if there is a protocol or recent review on your topic before undertaking a systematic review

- CINAHL (EBSCO)
  - Nursing and allied health

- APA PsycInfo (Ovid)
  - Journal articles, books, and dissertations on psychology and related fields
Identifying Resources to Conduct Research

Scopus (Elsevier)

- Multi-disciplinary (health sciences, physical sciences, social sciences, life sciences)
- “Cited by” feature
- Huge breadth of coverage including conference proceedings and web sources

Web of Science (Clarivate)

- Multi-disciplinary (health sciences, physical sciences, social sciences, life sciences, humanities)
- “Cited by” feature
- Includes book chapters and conference proceedings
Why MEDLINE?

• Covers clinical medicine, basic life sciences, core veterinary, nursing, and dentistry
• Authoritative, peer-reviewed, and comprehensive
• Contains 26 million+ references from 5,200+ journals
• Coverage from 1966 with selected coverage from 1946
• Indexed with MeSH (Medical Subject Headings)
• Both Ovid MEDLINE and PubMed:
  • Are interfaces used to search the MEDLINE database
  • Contain additional content beyond MEDLINE
    • PubMedCentral full text articles deposited to promote open access
    • Records that are “in process” (prior to being indexed with MeSH terms)
    • Articles submitted by publishers “ahead of print” (before the full article is published)

• PubMed is considered by some to be more user friendly
• Ovid MEDLINE allows you to perform a more focused search
Identifying Resources to Conduct Research

• Grey literature
  • Any literature that has not been published through traditional means
  • Includes government reports, technical reports, unpublished clinical trials, program evaluation reports, committee reports, theses/dissertations, conference papers/abstracts, and standards/best practices
  • Minimizes reporting and publication bias
Identifying Resources to Conduct Research

• Sources of grey literature:
  • Professional society websites
  • Government websites
  • Conference websites
  • Clinical trial registries
    • Cochrane Central Register of Controlled Trials (CENTRAL)
    • ClinicalTrials.gov
  • Canadian Electronic Library (Canada), OpenGrey (Europe)
  • ProQuest Dissertations and Theses Global

https://www.cadth.ca/resources/finding-evidence/grey-matters
<table>
<thead>
<tr>
<th>When is Comprehensive Searching Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrative Review</strong></td>
</tr>
<tr>
<td>• Summary of research that covers a wide area</td>
</tr>
<tr>
<td>• Broad research question</td>
</tr>
<tr>
<td>• Recent/current literature</td>
</tr>
<tr>
<td>• <strong>May not include comprehensive searching</strong></td>
</tr>
<tr>
<td>• No quality assessment</td>
</tr>
<tr>
<td><strong>Scoping Review</strong></td>
</tr>
<tr>
<td>• Assesses the size and scope of available research literature in order to identify gaps and research needs</td>
</tr>
<tr>
<td>• Focused research question, broad parameters</td>
</tr>
<tr>
<td>• All relevant literature</td>
</tr>
<tr>
<td>• <strong>Comprehensive searching</strong></td>
</tr>
<tr>
<td>• Explicit methods for study selection</td>
</tr>
<tr>
<td>• No quality assessment</td>
</tr>
<tr>
<td><strong>Systematic Review</strong></td>
</tr>
<tr>
<td>• Aims to generate a conclusion about the effectiveness of a specific intervention or program</td>
</tr>
<tr>
<td>• Focused research question, narrow parameters</td>
</tr>
<tr>
<td>• All relevant literature</td>
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<td>• Quality assessment</td>
</tr>
<tr>
<td>• May include a meta-analysis</td>
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</tbody>
</table>

Developing a Search Strategy: Identifying Concepts
Identifying Concepts

1. Phrase your topic as a research question
2. Identify the key concepts (perhaps using PICO)
3. Brainstorm related terms to search for each concept
4. Combine your related terms with an OR and your separate concepts with an AND

<table>
<thead>
<tr>
<th>Concept 1</th>
<th>Concept 2</th>
<th>Concept 3</th>
</tr>
</thead>
</table>
| Related Term 1
  OR
Related Term 2
  OR
Related Term 3 | Related Term 1
  OR
Related Term 2
  OR
Related Term 3 | Related Term 1
  OR
Related Term 2
  OR
Related Term 3 |
Phrase Your Topic as a Research Question

You’re broadly interested in how virtual reality (VR) can be used in pediatrics. After doing some initial searching, you see several studies talking about VR as a tool for pain reduction. You decide to zero in on the following research question:

Does virtual reality reduce pain in pediatric patients?
Identifying Concepts

Does virtual reality reduce pain in pediatric patients?

P = Patient, Population, or Problem
I = Intervention or Exposure
C = Comparison or Control
O = Outcome(s)
Does virtual reality reduce pain in pediatric patients?

\[ P = \text{Pediatric patients} \]
\[ I = \text{Virtual reality} \]
\[ C = \text{None} \]
\[ O = \text{Pain reduction} \]
Brainstorm Related Terms

- **Synonyms**: pediatrics/child/children
- **Related terms**: otitis media/ear infection
- **Different perspectives**: penicillin sensitivity/antibiotic resistance
- **Antonyms**: mental health/mental illness
- **Alternate spellings**: pediatrics/paediatrics
- **Alternate endings**: learning/learner/learns (learn*)
- **Acronyms and full spellings**: ADHD/attention deficit hyperactivity disorder
- **Hyphenated or not**: co-infection/coinfection
- **Generic and brand names**: acetaminophen/Tylenol
Identify synonyms and alternate terms

Does virtual reality reduce pain in pediatric patients?

<table>
<thead>
<tr>
<th>Virtual Reality</th>
<th>Pain Reduction</th>
<th>Pediatric Patients</th>
</tr>
</thead>
</table>

Combining Search Terms and Concepts

<table>
<thead>
<tr>
<th>Boolean Operator</th>
<th>Purpose</th>
<th>Example</th>
<th>Result</th>
</tr>
</thead>
</table>
| AND              | Connects key concepts        | Virtual reality AND pain AND children | • Narrows search  
• Finds only records with all the search concepts |
| OR               | Connects synonyms or similar terms within a concept | Virtual reality OR VR      | • Broadens search  
• Finds records with any or all of the search terms |
Developing a Search Strategy: Searching Subject Headings and Keywords
Turning concepts into a search strategy

Concept 1
Keywords
Controlled vocabulary

Concept 2
Keywords
Controlled vocabulary
Keyword Searching

- Retrieves:
  - New, cutting edge research that has not yet been indexed
  - Specific, obscure topics that may not have a MeSH heading assigned
- For comprehensive searches (e.g., systematic and scoping reviews), keyword searching, in addition to the use of subject headings, is essential
- Independent of any one electronic database
Title: Virtual reality for intravenous placement in the emergency department-a randomized controlled trial.

Abstract: This study sought to determine whether adding virtual reality (VR) was superior to standard of care alone in facilitating reduction in pain and anxiety among children who underwent intravenous catheterization in the emergency department (ED). Sixty-six children aged 6-16 years who needed intravenous placement received VR, or standard of care in the ED (videos, television, iPad, child life specialist). Outcome measures included change in pain score, level of anxiety, patient and parent satisfaction (pain and anxiety), number of trials, and procedure time. Compared with controls, the intervention group had similar age, sex, number of trials, and anesthetic use. Time of procedure was shorter in the VR group (median 5 min) but this was not statistically significant compared with 7 min for the control group. Pain in the intervention group was lower, even before the procedure. Difference in pain (before and after) and anxiety (after the procedure) were similar in both groups. Satisfaction from anxiety management was higher for the VR group (p < 0.007) and children rated VR significantly more "fun" (p < 0.024).

MeSH Subject Headings: Child
*Equipment and Supplies
Female
Humans
Male
Pain / et [Etiology]
*Pain / pc [Prevention & Control]
Pain Measurement / mt [Methods]
*Phlebotomy / ae [Adverse Effects]
*Virtual Reality
Medical Subject Headings (MeSH)

• “Tags” assigned by human indexers to describe what an article is about

• “Controlled vocabulary” regardless of author’s terms

• Why search with MeSH?
  • Enhances the number of relevant studies retrieved
  • Ensures the article is “about” your topic
  • Enables use of Explode and Focus features
Finding Subject Headings

Advanced Search

1 Resource selected | Hide | Change
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily 1948 to October

Enter keyword or phrase (* or $ for truncation)

- Keyword
- Author
- Title
- Journal

virtual reality
Limits (close)
Map Term to Subject Heading

Select | Subject Heading
-------|------------------
✓      | Virtual Reality
      | User-Computer Interface
      | Humans
      | Computer Simulation
### Subject Heading Scope Notes

<table>
<thead>
<tr>
<th>Select</th>
<th>Subject Heading</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑</td>
<td>Virtual Reality</td>
<td></td>
</tr>
<tr>
<td></td>
<td>User-Computer Interface</td>
<td></td>
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**Scope Note for: Virtual Reality**

**MeSH HEADING:** VIRTUAL REALITY

**SCOPE:** Using computer technology to create and maintain an environment and project a user's physical presence in that environment allowing the user to interact with it.

**YEAR of ENTRY:** 2018

**REFERENCES:**

Used For:
- educational virtual realities
- instructional virtual reality
- instructional virtual realities
- instructional virtual reality, educational virtual reality
- instructional virtual reality, virtual reality
- virtual realities, educational virtual realities, instructional virtual reality
- virtual reality
- virtual reality, educational virtual reality
- virtual reality, instructional
Subject heading hierarchies

- Subject headings are organized hierarchically
- Go to the “Full Tree” and use the [+] beside applicable subject headings to determine if there are narrower terms of interest
Exploding Subject Headings

- Explode captures the subject heading of interest, along with all the subject headings that fall beneath it.
• Subheadings are secondary topics pre-linked to Medical Subject Headings by an indexer

• Only select a subheading if it matches exactly what you are searching for

• Not typically recommended for comprehensive searches
Keyword Searching in Ovid

• Search term.mp = term in one of multiple fields (default mode)
  • Title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier

• Search term.tw = term in title or abstract

• Search term.kf = term in author-supplied keywords

• Search term.tw,kf = term in title, abstract, or author-supplied keywords
Keyword Searching Tips: Truncation

- Finds variant endings of a word stem
  - E.g., adolescen* retrieves adolescent, adolescents, and adolescence
- Use truncation only when keyword searching
- The truncation symbol may vary by database, but is usually *
Keyword Searching Tips: Adjacency

- Used to find terms that appear close together in whatever field you’re searching
- Search term `ADJ2` search term
  - Finds terms in any order within a specified number (n) of words of each other
  - E.g., pain ADJ2 manag* finds “pain management,” “management of pain,” “manage cancer pain,” and so on
- The adjacency operator varies by database (e.g., N# in CINAHL)
Keyword Searching Tips: Wildcard

• The wildcard character (?) replaces one character with another character or no character at all

• Examples:
  • P?ediatrics for paediatrics and pediatrics
  • Tumo?r for tumour and tumor

• The wildcard character varies by database (e.g. # in CINAHL)
### Combining Search Terms and Concepts

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• Finds only records with all the search concepts |
| **OR**           | Connects synonyms or similar terms within a concept | Pain/ OR Pain Management/ OR pain* OR discomfort* OR suffering* | • Broadens search  
• Finds records with any or all of the search terms |
Applying Limits

• Use limits only after you have combined your key concepts

• Common limits include:
  • English language
  • Publication types (e.g., RCTs)
  • Species (e.g., Humans)
  • Publication date
  • Age groups (e.g., Child: birth-18 years)

• Limits restrict results to MEDLINE records only, not the ahead of print, in-process, and other non-indexed content

• For comprehensive searches, it is better to use search hedges than limits within a database
Testing Your Search Strategy

• Pre-test your search strategy in one or two databases
• If your search did not retrieve known relevant articles, check:
  • Indexing
  • Keywords
  • Subject headings
• Try strategies to broaden or narrow your search
Broadening or Narrowing a Search

**Broaden**
- Use more general terms
- Include more synonyms
- Drop the least important concepts from your search
- Apply truncation symbols to word stems
- Remove/reduce limits

**Narrow**
- Use more specific terms
- Decrease # of synonyms
- Add concepts to your search
- Use proximity/adjacency operators
- Apply additional search limits
Saving and Documenting Searches
Save Your Search Strategy

- Name your search with your topic and the database you searched in
- To retrieve your saved search, click “View Saved” on main page
Managing Results

• Print or email your results or export them to EndNote, Mendeley, or Covidence

• Get full-text access to an article by clicking

• Request through interlibrary loan if not held at UCalgary Library: https://library.ucalgary.ca/interlibrary/
Document Your Search

- Note database, number of results, and date of search
- If conducting a systematic review, use [PRISMA Guidelines](https://www.prismastudy.org/) to document your search
Getting Help
Locating Research Guides

- Pediatrics
- Mobile Apps and Resources
- Systematic Reviews Skills Curriculum
- Systematic Reviews in the Health Sciences
- Citing & Writing in the Health Sciences
Registering for Library Workshops

Topics include:

- Literature review types
- Systematic reviews
- Systematic searching
- Research data management
- Covidence
- EndNote
- NVivo
- Qualtrics
Ask Questions – Online Chat

https://library.ucalgary.ca
Meet with our Staff

https://library.ucalgary.ca/consultation
Thank you for attending!

For more information, go to library.ucalgary.ca/hsl

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