Neurosurgery Presentation. Part 2

Conducting Systematic Reviews

TIPS FOR SEARCHING

2nd May 2019
What is a Systematic Review?

“A collation of all empirical evidence that fits pre-specified eligibility criteria in order to answer a specific research question. It uses explicit, systematic methods that are selected with a view to minimizing bias and providing reliable findings from which conclusions can be drawn and decisions made (Antman 1992, Oxman 1993)”. The key characteristics of a systematic review are:

• a clearly stated set of objectives with pre-defined eligibility criteria for studies.
• an explicit, reproducible methodology.
• a systematic search that attempts to identify all studies that would meet the eligibility criteria.
• an assessment of the validity of the findings of the included studies, for example through the assessment of risk of bias.
• a systematic presentation, and synthesis, of the characteristics and findings of the included studies."

• Many systematic reviews follow guidelines such as JBI, Cochrane and PRISMA
## Differences between a literature review and a systematic review

<table>
<thead>
<tr>
<th></th>
<th>Systematic review</th>
<th>Topic/Literature review</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Review question</strong></td>
<td>Starts with clear question to be answered or hypothesis to be tested</td>
<td>May also start with clear question to be answered, but more often involve general discussion of subject with no stated hypothesis</td>
</tr>
<tr>
<td><strong>Background</strong></td>
<td>Provide summaries of the available literature on a topic</td>
<td></td>
</tr>
<tr>
<td><strong>Searching for relevant studies</strong></td>
<td>Strive to locate all relevant published and unpublished studies to limit impact of publication and other biases</td>
<td>Do not usually attempt to locate all relevant literature. Strategy not explicitly stated</td>
</tr>
<tr>
<td><strong>Deciding which studies to include and exclude</strong></td>
<td>Involve explicit description of what types of studies are to be included to limit selection bias on behalf of reviewer</td>
<td>Usually do not describe why certain studies are included and others excluded</td>
</tr>
<tr>
<td><strong>Assessing study quality</strong></td>
<td>Examine in systematic manner methods used in primary studies, and investigate potential biases in those studies and sources of heterogeneity between study results</td>
<td>Often do not consider differences in study methods or study quality</td>
</tr>
<tr>
<td><strong>Results and data synthesis</strong></td>
<td>Base their conclusions on those studies which are most methodologically sound</td>
<td>Often do not differentiate between methodologically sound and unsound studies. May also be influenced by the reviewer's theories, needs and beliefs</td>
</tr>
<tr>
<td><strong>Discussion</strong></td>
<td>Written by an expert or group of experts with a detailed and well-grounded knowledge of the issues</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from:


Selected SR Producing Organizations

• EPPI-Centre
  http://eppi.ioe.ac.uk

• Campbell Collaboration
  www.campbellcollaboration.org

• Cochrane Collaboration
  www.cochrane.org

Joanna Briggs Institute
  http://joannabriggs.org/
Steps in a Systematic Review

- Formulate review question
- Define inclusion and exclusion criteria
- Locate studies
- Select studies
- Assess study quality
- Extract data
- Analysis/summary and synthesis of relevant studies
- Present results
- Interpret results/determining the applicability of results
Where to begin searching?

PREPARE TO SEARCH

- Have PRISMA statement and Checklist handy (or another guideline).
- Write the question and use PICO to develop search terms
- Set up personal accounts in Medline, Embase, Scopus, PubMed to save searches
- Set up weekly alerts in Medline, Embase and/or Scopus if review preparation is going to take more than 6 months.
## INTRODUCTION

<table>
<thead>
<tr>
<th>Item</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale</td>
<td>3</td>
</tr>
<tr>
<td>Describe the rationale for the review in the context of what is already known.</td>
<td></td>
</tr>
<tr>
<td>Objectives</td>
<td>4</td>
</tr>
<tr>
<td>Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).</td>
<td></td>
</tr>
</tbody>
</table>

## METHODS

<table>
<thead>
<tr>
<th>Item</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol and registration</td>
<td>5</td>
</tr>
<tr>
<td>Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.</td>
<td></td>
</tr>
<tr>
<td>Eligibility criteria</td>
<td>6</td>
</tr>
<tr>
<td>Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.</td>
<td></td>
</tr>
<tr>
<td>Information sources</td>
<td>7</td>
</tr>
<tr>
<td>Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.</td>
<td></td>
</tr>
<tr>
<td>Search</td>
<td>8</td>
</tr>
<tr>
<td>Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.</td>
<td></td>
</tr>
</tbody>
</table>

## RESULTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study selection</td>
<td>17</td>
</tr>
<tr>
<td>Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.</td>
<td></td>
</tr>
<tr>
<td>Study characteristics</td>
<td>18</td>
</tr>
<tr>
<td>For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.</td>
<td></td>
</tr>
</tbody>
</table>

PRISMA FLOW DIAGRAM  TEMPLATE

http://www.prisma-statement.org/PRISMAStatement/FlowDiagram
Getting started

DEVELOP THE SYSTEMATIC REVIEW QUESTION

• Set out search components using PICO or another acronym
• Write question sentence in full to focus your mind on its key elements. Use concept map if helpful.
• Use question builder to find synonyms for the key terms and to determine strategy

Question:
In patients with neurofibromatosis type 2 and bilateral vestibular schwannomas, how effective is stereotactic radiosurgery compared to microsurgery in achieving local control, minimizing recurrence rates and preserving hearing and facial nerves?
**Scenario:** A patient with Neurofibromatosis Type 2 and bilateral vestibular schwannomas is requiring treatment. Is stereotactic radiosurgery more effective than microsurgery in treating schwannomas whilst preserving hearing and facial nerves as well as controlling recurrence?

**PICO Question:** In patients with neurofibromatosis type 2 and bilateral vestibular schwannomas, how effective is stereotactic radiosurgery compared to microsurgery in achieving local control, minimizing recurrence rates and preserving hearing and facial nerves?

**Search terms (keywords and subject headings)**

<table>
<thead>
<tr>
<th>Patient/Population</th>
<th>Intervention/Exposure</th>
<th>Comparison</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurofibromatosis Type 2 <strong>AND</strong></td>
<td>microsurgery</td>
<td>Stereotactic radiosurgery</td>
<td>hearing</td>
</tr>
<tr>
<td>Bilateral Vestibular schwannoma</td>
<td>surgery</td>
<td>SRS</td>
<td>Recur*</td>
</tr>
<tr>
<td>Acoustic neuroma</td>
<td>Surgical procedure</td>
<td>Gamma knife</td>
<td>Facial nerve*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>radiation</td>
<td>Treatment outcome</td>
</tr>
</tbody>
</table>

- **AND**
- **AND**
- **AND**

**Type of Question:** therapy/diagnosis/prognosis/etiology/prevention/cost

**Type of study:** RCT/cohort/case-control/case series/ meta-analysis/systematic review

**PICO** suits the question. The asterisk (*) is a wildcard and searches for spelling variations and different word endings.
Systematic Review

Inclusion Criteria: English, prospective and retrospective case series over 50 patients, randomized clinical trials

Exclusion criteria: Non-English papers, case reports,

Databases
- Medline
- Embase
- Scopus
- Cochrane
- Clinical Trials
- Editorials, conference papers
The O (Outcomes) part of the search isn’t included as that would reduce the results too much. Look for the Outcomes in the existing 59 results. Incorporate Inclusion/Exclusion criteria when scanning results.
“Neurosurgical Procedures/” is a major subject heading and can be added without the sub-heading. All sub-headings are automatically included. Including only one (Methods) can omit potentially useful results.
Ovid Medline – iterative searching

EXPAND SEARCH WITH KEYWORDS AND SUBJECT HEADINGS

The first 2 headings have small numbers. Add keywords to expand the retrieval of papers on neurofibromatosis 2 and acoustic neuroma. See next screen…

Adding **Neurosurgical procedures/** increases the total number of results from 59 to 61
Line 14: Add **neurofibromatosis type 2.mp.** as keyword and link it to line 1 with **or (Neurofibromatosis Type 2/)**

Line 17: Add **vestibular schwannoma.mp.** as a keyword and link to lines 2 and 3 (Lines 18 and 19). This has increased total results to 101
Broaden Medline search – another option

USE ADJACENCY OPERATOR, COMBINE WITH OR

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Neurofibromatosis 2/ or neurofibromatosis type 2.mp.</td>
<td>2031</td>
</tr>
<tr>
<td>2</td>
<td>Neuroma, Acoustic/ or vestibular schwannoma.mp.</td>
<td>7546</td>
</tr>
<tr>
<td>3</td>
<td>bilateral.lt.ab.</td>
<td>231947</td>
</tr>
<tr>
<td>4</td>
<td>2 and 3</td>
<td>473</td>
</tr>
<tr>
<td>5</td>
<td>1 and 4</td>
<td>206</td>
</tr>
<tr>
<td>6</td>
<td>Radiosurgery/</td>
<td>13990</td>
</tr>
<tr>
<td>7</td>
<td>Microsurgery/ or Neurosurgical Procedures/</td>
<td>51950</td>
</tr>
<tr>
<td>8</td>
<td>(surgery or surgical).lt.ab.</td>
<td>1625008</td>
</tr>
<tr>
<td>9</td>
<td>6 or 7 or 8</td>
<td>1659548</td>
</tr>
<tr>
<td>10</td>
<td>5 and 9</td>
<td>98</td>
</tr>
<tr>
<td>11</td>
<td>(bilateral adj2 schwannoma).mp.</td>
<td>55</td>
</tr>
<tr>
<td>12</td>
<td>4 or 11</td>
<td>481</td>
</tr>
</tbody>
</table>
New Ovid Feature:

EDIT SEARCH FOR INCLUSION IN MANUSCRIPT

Click on “More” on any line, then Edit to move lines for ease of reading.
Use Actions icons to move synonyms together
**FINAL MEDLINE SEARCH STRATEGY FOR INCLUSION IN SYSTEMATIC REVIEW.**

**SAVE IT AND SET UP SEARCH ALERT**

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Neurofibromatosis 2/ or neurofibromatosis type 2.mp.</td>
<td>2035</td>
</tr>
<tr>
<td>2</td>
<td>Neuroma, Acoustic/ or vestibular schwannoma.mp.</td>
<td>7548</td>
</tr>
<tr>
<td>3</td>
<td>bilateral.ti,ab.</td>
<td>231788</td>
</tr>
<tr>
<td>4</td>
<td>2 and 3</td>
<td>477</td>
</tr>
<tr>
<td>5</td>
<td>1 and 4</td>
<td>211</td>
</tr>
<tr>
<td>6</td>
<td>Radiosurgery/</td>
<td>13973</td>
</tr>
<tr>
<td>7</td>
<td>Microsurgery/ or Neurosurgical Procedures/</td>
<td>51936</td>
</tr>
<tr>
<td>8</td>
<td>(surgery or surgical).ti,ab.</td>
<td>1624069</td>
</tr>
<tr>
<td>9</td>
<td>6 or 7 or 8</td>
<td>1658529</td>
</tr>
<tr>
<td>10</td>
<td>5 and 9</td>
<td>101</td>
</tr>
</tbody>
</table>
Create alerts in Ovid Medline and Ovid Embase

SET UP PERSONAL ACCOUNTS, REQUEST THEM WEEKLY.

https://www.google.com/search?q=set+up+alert+in+ovid&rlz=1C1GCEJ_enAU833AU833&oq=set+up+alert+in+ovid&aqs=chrome..69i57.5286j0j8&sourceid=chrome&ie=UTF-8#kpvalbx=1

https://www.youtube.com/watch?v=lkNli-wQ9HQ

https://www.brainshark.com/wkovid/vu?pi=zIHz19pp14z2tkwz0&nodesktopflash=1
Cochrane Library

HOW TO SEARCH FOR A SYSTEMATIC REVIEW

Collection of small databases, includes Systematic Reviews, Abstracts, Trials etc. From the Advanced page searches can include MeSH (Medical Subject Headings) and keywords. Cochrane Library is a small resource – use fewer search terms for maximum retrieval.
Cochrane Library

COMBINE SETS – 9 RESULTS. ONLY 1 REVIEW & 8 TRIALS

1 Cochrane Review matching on "#4 - #1 AND #2 AND #3"

Cochrane Database of Systematic Reviews
Issue 5 of 12, May 2019

Order by: Relevance

1. Stereotactic radiotherapy for vestibular schwannoma
   Dario Mozetic, Jelena Ljepcevic, Bruno Sipurski, Per Cayé-Thomsen
   Show Preview • Intervention Review 16 December 2014
Scopus

LARGE, KEYWORD SEARCH-ONLY DATABASE.

Use one line for each part of PICO. Include all synonyms. This can take time.

Search
- neurofibromatosis
  - Article title, Abstract, Keywords
  - AND
  - schwannoma OR neuroma
  - Article title, Abstract, Keywords
  - AND
  - radiosurgery or gamma knife
  - Article title, Abstract, Keywords
  - OR
  - surgery OR microsurgery OR *surgical
  - Article title, Abstract, Keywords
Too many results. Need to narrow search.
Use drop down menu to search in the Abstract field for papers. This search yields 59 papers.
Scopus Limits?

Don’t use too many limits to reduce a large number of results. For a systematic review, just use ‘date range’ and ‘language’, if needed.
What about Google Scholar?

- Go through **Library webpage** link and login – you’ll have access to all subscribed resources.

- Useful for **background** searching – or if there are **not many papers** on your question.

- To reduce a large number of results, use the **Advanced search screen** (via the menu). This allows you to do some field searching (by title, author, journal) and phrase searching, as well as “NOT” searching.

- Google Scholar usually retrieves peer-reviewed articles. For grey literature, such as government reports, guidelines, conference papers, it is better to search across the web – ie: **google.com**
Search those resources that make the most sense for your research question. At a minimum, consider searching Abstracts and Conferences. If your question involves drugs and interventions, check trial registries and pharma data. Also check out the papers and reports of relevant stakeholder organizations.

Conference Abstracts, editorials, letters to editors
Ovid Medline and Ovid Embase
Use Publication Type limits within the Additional Limits tab on the Advanced Search page
Open Grey  Includes conference abstracts, research reports, doctoral dissertations

Clinical Trials Registries:
ClinicalTrials.gov
World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP)
Drug companies often list current trials on their websites

Government Reports and Guidelines
Search via Google.com. Add domain .gov or .gov.nsw or .gov.au

https://guides.mclibrary.duke.edu/sysreview/greylit
Grey literature

Repositories and Reports

Google Scholar
Grey Literature Report
PROSPERO - International Register of prospective Systematic reviews
GreySource

Theses

Find a Thesis (within and outside Macquarie Uni)
EndNote and searching

GET THE MOST OUT OF ENDNOTE WHEN SEARCHING FOR SYSTEMATIC REVIEWS

- Create **groups** in EndNote – helps to organise your references
- Enable **Find Full Text** function in EndNote. Macquarie link: https://libguides.mq.edu.au/endnotex9pc/preferences_full_text
- Create a display field for **Database Name** (helps with documenting search strategy)
- Find and review **duplicates. Note:** after you use the EndNote Remove Duplicates function, sort references by author name and **manually check for duplicates.** EndNote does miss some duplicates, depending on where in the record disparities occur.
- **Share EndNote Library** with colleagues and supervisors
- Use **Search Tracker** (USyd Excel sheet template) to document information about searches
- Export your EndNote references to **Excel**

Instructions for carrying out these steps are found in the following LibGuide

University of Sydney LibGuide
PRESS Checklist Questions
(Peer Review of Electronic Search Strategies)

1. **Translation**: Is the search question translated well into search concepts?
2. **Operators**: Are there any mistakes in the use of Boolean or proximity operators?
3. **Subject headings**: Are any important subject headings missing or have any irrelevant ones been included?
4. **Natural language (use of keywords)**: Are any natural language terms or spelling variants missing, or have any irrelevant ones been included? Is truncation used optimally?
5. **Spelling & syntax**: Does the search strategy have any spelling mistakes, system syntax errors, or wrong line numbers?
6. **Limits**: Do any of the limits used seem unwarranted or are any potentially helpful limits missing?
7. Has the search strategy been adapted for each database to be searched?

Quiz

• When developing a question, what does PEO stand for?

• MeSH is the name of the Medical Subject Headings in Medline. What is the equivalent in Embase called?

• What does “ ” (Quotation marks) mean in Scopus: “ventriculostomy-related infection”

• What does .mp. mean in Medline? When would you use it?

• What does this search string in Embase mean: Arteriovenous malformation adj2 brain

• Where would you search to find the symptoms of trigeminal neuralgia?

• What does .ti,ab. Mean in Embase?
Need Help?

Clinical Librarian

Mary Simons

Contact:
Macquarie University Library
Macquarie University, NSW 2109
(02)9850 7536
Email: mary.simons@mq.edu.au

Clinical Librarian

Jeremy Cullis

Contact:
9850 7399 Email: jeremy.cullis@mq.edu.au