

# Advanced searching

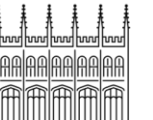
for systematic reviews and evidence syntheses

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# What we'll cover today

- Build a search strategy on Medline, using [Yale MeSH Analyzer](#) to optimise the use of subject headings
- Adapt the search across multiple databases with the help of [Polyglot](#)
- Describe alternative methods for identifying references, including citation tracking
- De-duplicate results from multiple database searches
- Start screening results for inclusion in your review
- Report your search methods according to [PRISMA-S](#)

# Key guidance

## Conducting searches

Lefebvre C, et al. Searching for and selecting studies. In: Higgins J, Thomas J, Chandler J, Cumpston M, Li T, Page M, Welch V, editors. Cochrane Handbook for Systematic Reviews of Interventions. version 6.4: Cochrane; 2023. [www.training.cochrane.org/handbook](http://www.training.cochrane.org/handbook).

## Reporting searches

EQUATOR Network. PRISMA-S: an extension to the PRISMA Statement for Reporting Literature Searches in Systematic Reviews: Equator Network; 2021 <https://www.equator-network.org/reporting-guidelines/prisma-s/>.

# Scoping search

- Initial search
  - Establish parameters for the review
  - Verify that no existing review exists
  - Identify pool of studies to inform development and validation of search strategy
- Where to start?
  - PubMed
  - Simple search using key concepts

# Break down your question: key concepts

Can palliative care volunteers provide psychosocial and emotional support for patients as they approach the end of life?

- Patients at the end of life
- Volunteers
- Emotional support, psychosocial support, spiritual care, supportive care...

# Break down your question: PICO

Can palliative care volunteers provide psychosocial and emotional support for patients as they approach the end of life?

Population = Patients at the end of life

Intervention = Volunteers

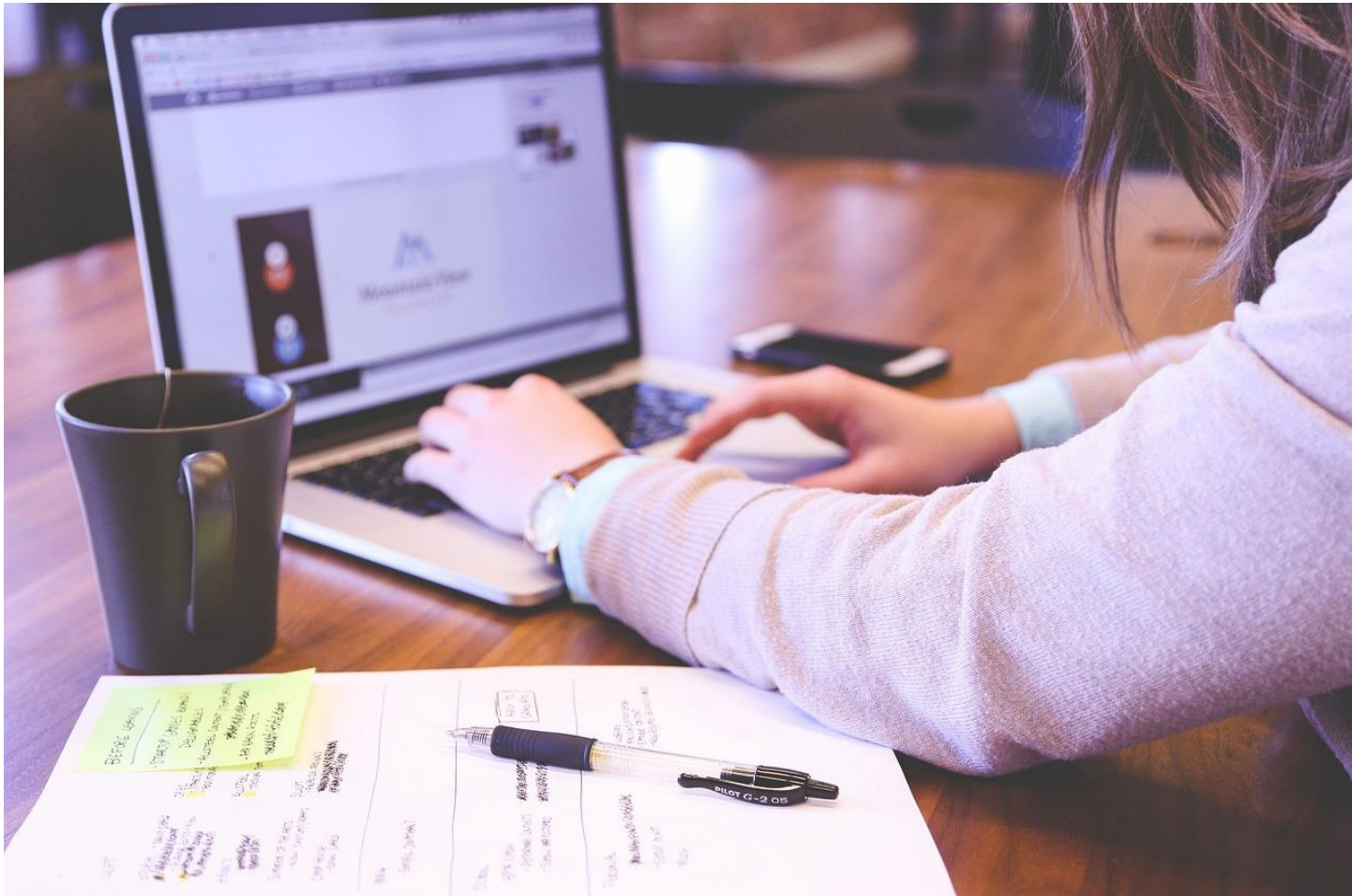
Comparison = Usual care

Outcome = wellbeing, psychosocial outcomes, stress, distress, anxiety...

# Scoping searches: PubMed

- Simple search – think Google
- Adjust search terms to change results
- Save relevant papers to Clipboard or email them to yourself – you'll need those later

# Practical





# Developing a search strategy: author keywords

Based on the papers found in your scoping search - think about your key concepts:

- Which terms have authors used in the title?
- Which terms have authors used in the abstract?
- Which terms have authors assigned as keywords?

NB You can't search the full paper within most databases

# A Novel Palliative Care Peer Support Program for Adolescents and Young Adults: Survey and Factor Analytic Study

## **Abstract**

**Background:** Palliative care literature indicates a dearth of programs addressing the psychosocial needs of adolescents and young adults (AYAs).

**Objectives:** This study assessed patient-reported experiences of a palliative care peer support program, analyzed psychometric qualities of the program evaluation, and examined associations with quality-of-life scores to assess validity and potential impact on aspects of AYA quality of life.

**Design:** This retrospective, cross-sectional study described self-reported Streetlight program evaluation and quality of life of AYA patients, exploratory factor analysis of survey responses, and analysis of associations with quality of life.

**Setting/Subjects:** AYA participants (13–30) enrolled in the Streetlight program for at least six months were recruited during hospital admissions and clinic visits at UF Health Shands Hospital.

**Results:** Participants' ( $n = 69$ ) scores were high for Youth Quality of Life Instrument-Short Form (YQOL-SF) (82.6 of 100), and Streetlight evaluations (4.47 of 5). Patients endorsed themes of: high-quality friendships with volunteers, transformative impacts to wellbeing, and benefits to mental health and coping in open-ended responses. Analyses identified three factors explaining 61% of variance in Streetlight program evaluation responses: "Friendships and Support" (26%); "Coping, Family, and Providers" (20%); and "Diversion and Respect" (15%). Significant positive associations were found between Streetlight evaluation scores and YQOL-SF Belief in Self and Family factor scores, as well as between Streetlight evaluation Friendships and Support factor scores, and YQOL-SF total and factor-specific scores.

**Conclusions:** Results suggest that the Streetlight program is a viable model to facilitate positive experiences, opportunities for socialization, and meaningful peer support for AYA patients.

# Developing a search strategy: adding subject headings

- Many (but not all) databases have a controlled vocabulary - index terms or subject headings
- In Medline, we have Medical Subject Headings (MeSH), but other databases will have their own version.
- These allow you to search for a concept even if authors have used different terminology e.g. papers reporting on volunteers, voluntary workers, unpaid workers will be tagged with the MeSH term Volunteer

# Developing a search strategy: [Yale MeSH Analyzer](#)

- Take the papers you found on PubMed during your scoping search
- Copy the unique identifiers (PMIDs) into Yale MeSH Analyzer
- Make a note of relevant subject headings

# Practical



# Combining search concepts & shortcuts

- AND – combine 2 concepts together to focus the search
- OR – combine search terms for the same concept to broaden the search
- NOT – exclude concepts from your search (Warning, use carefully)
- Adjn – search for 2 terms within a certain number of words of each other
- \* - truncation – replaces 0 or more letters at the end of a word
- ? - wild card – replaces 0 or 1 letters within or at the end of a word
- Always look for a help button if you're not sure how to use them!

# Building your search: Medline



# Practical





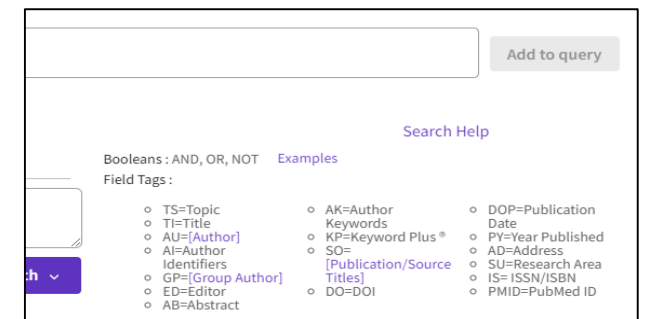
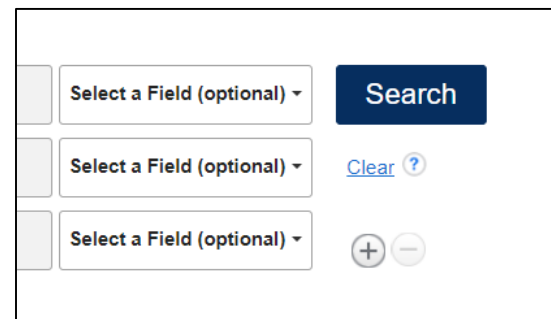
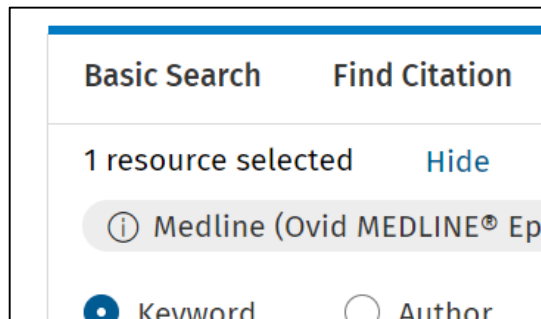
# Break

# Other resources via Database A-Z

- **ASSIA** – social care & social work
- **Cochrane Library** – systematic reviews & trials
- **CINAHL** – nursing & allied health
- **Embase** – health & medicine
- **Global Health** – population health
- **Medline** – health & medicine
- **PEDRO** – physiotherapy
- **PsycINFO** – psychiatry & psychology
- **Science Citation Index** – science (part of Web of Science)
- **Scopus** - multidisciplinary

# Translating searches

- For systematic reviews, you will need to run searches in multiple databases
- Each database has similar functionality, but some differences
- Sometimes syntax (\*, ?, "", .mp, adj3) is different
- Use of subject headings (MeSH, thesaurus terms) varies
- Always look for a help button if you're not sure!



# Polyglot – SR Accelerator

- Free tool from SR Accelerator: <https://sr-accelerator.com/#/polyglot>
- Use it to translate PubMed or Medline searches into other databases
- A good starting point but make sure you understand how the search works
- Beware of copying MeSH headings!

# Polyglot – PubMed search example

```
Your query ☑ Replace Line References 📄 🗑️ 🔍 ⌵
```

```
1 ("palliative care"[MeSH Terms] OR ("palliative"[Title/Abstract] AND "care"[Title/Abstract])) OR "palliative care"[Title/Abstract] AND ("volunteer"[Title/Abstract] OR "volunteered"[Title/Abstract] OR "volunteers"[MeSH Terms] OR "volunteers"[Title/Abstract] OR "volunteer"[Title/Abstract] OR "volunteering"[Title/Abstract])
```

```
▼ CINAHL (Ebsco) 📄
```

```
((MH "palliative care+") OR ((TI palliative OR AB palliative) AND (TI care OR AB care)) OR (TI "palliative care" OR AB "palliative care")) AND ((TI volunteer OR AB volunteer) OR (TI volunteered OR AB volunteered) OR (MH volunteers+) OR (TI volunteers OR AB volunteers) OR (TI volunteer OR AB volunteer) OR (TI volunteering OR AB volunteering))
```

# Polyglot – Medline search example

Your query

```
1 Palliative Care/  
2 (palliative adj3 (care* or caring)).mp.  
3 (end of life care or terminal care).ti,ab,kw.  
4 1 or 2 or 3  
5 exp Volunteers/  
6 volunteer*.mp.  
7 5 or 6  
8 4 and 7  
9
```

▼ CINAHL (Ebsco)

```
(MH "Palliative Care")  
(palliative N3 (care* OR caring))  
((TI "end of life care" OR AB "end of life care") OR (TI "terminal care" OR AB "terminal care")) ,kw.  
S1 OR S2 OR S3  
(MH Volunteers+)  
volunteer*  
S5 OR S6  
S4 AND S7
```

# Polyglot – does it get it right?

The screenshot shows a search interface for CINAHL (Ebsco) with the following text and callouts:

- Thesaurus terms** (with a red X): A callout pointing to the text "(MH 'Palliative Care')".
- Proximity searching** (with a green checkmark): A callout pointing to the text "(palliative N3 (care\* OR caring))".
- Field codes (ti, ab, kw) ?** (with a blue question mark): A callout pointing to the text "(TI 'end of life care' OR AB 'end of life care') OR (TI 'terminal care' OR AB 'terminal care')) ,kw.". The field codes 'ti', 'ab', and 'kw' are highlighted in blue.
- Truncation with \*** (with a green checkmark): A callout pointing to the text "volunteer\*".
- Quotation marks** (with a green checkmark): A callout pointing to the text "'end of life care'" and "'terminal care'".
- Combining lines with AND and OR** (with a green checkmark): A callout pointing to the text "S1 OR S2 OR S3" and "S4 AND S7".

The search text in the interface is:

```
(MH "Palliative Care")  
(palliative N3 (care* OR caring))  
((TI "end of life care" OR AB "end of life care") OR (TI "terminal care" OR AB "terminal care")) ,kw.  
S1 OR S2 OR S3  
(MH Volunteers+)  
volunteer*  
S5 OR S6  
S4 AND S7
```

# Polyglot - conclusions

## Pros

- Good starting point
- Serves as a reminder for tricky syntax

## Cons

- Does not work with MeSH/thesaurus terms
- Does not understand all syntax
- May be better ways to use a database
- Need to copy/paste each line



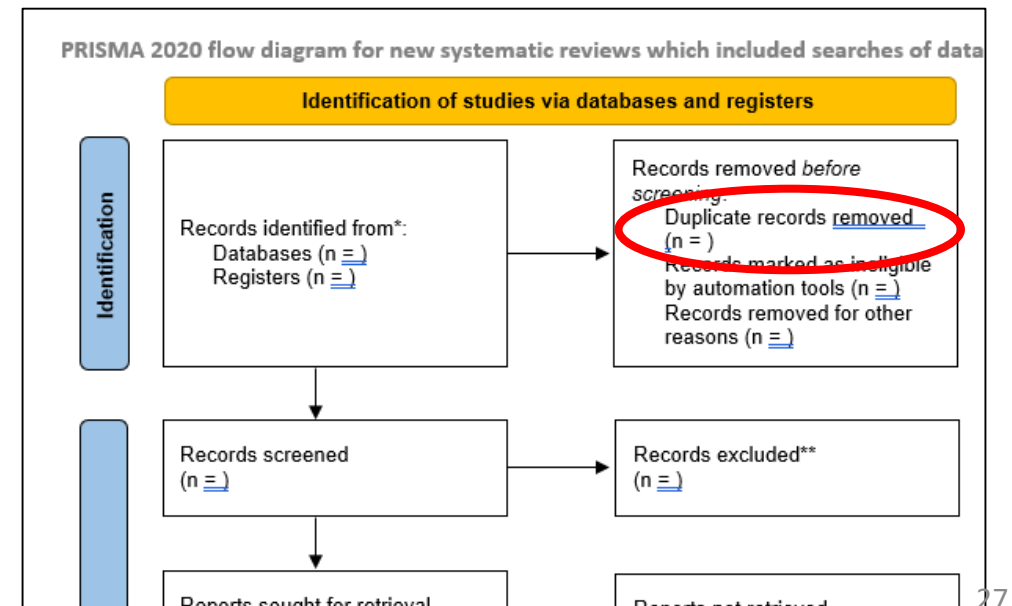
# Practical



# Break

# Deduplication

- You will get duplicate records from searching in multiple databases
- There are many automated tools to help with deduplication
- You may also find additional duplicates when screening
- Report duplicates removed in your PRISMA flowchart



# Deduplication – available tools

- Rayyan – free tool but more functionality from paid options. Student version \$48 per year <https://www.rayyan.ai/>
- Covidence – paid subscription online, currently \$289 per year <https://www.covidence.org/>
- Deduplicator from SR Accelerator – free browser-based tool
- EndNote – download via IT Services
- Other reference managers (RefWorks, Zotero) – less flexible deduplication than EndNote

# Deduplicator – SR Accelerator

- Free tool from SR Accelerator:  
<https://sr-accelerator.com/#/deduplicator>
- Upload files from databases or reference manager (e.g. EndNote)
- Choose between:
  - Focused (more manual checking, more duplicates flagged)
  - Relaxed (less manual checking but more duplicates may remain)
- Check flagged duplicates and correct any errors
- Save deduplicated results

# Deduplicator – upload your files

The screenshot shows the Deduplicator web application interface. At the top, there is a dark blue header with the text "Deduplicator". Below the header is a navigation bar with the following menu items: "File", "Edit", "Display Columns", and "Help". The main content area is light gray and contains a central panel with a white background. At the top of this panel is a dark blue button labeled "Deduplicate" and a link "Remove Already Screened & Deduplicate". Below this is a bold instruction: "To begin deduplication, choose a library or drop it here". Underneath is a text input field with the placeholder text "Choose a library or drop it here (xml, nbib, ris, txt, ddpe)..." and a "Browse" button to its right. Below the input field is a dark blue button labeled "Add Another File +". At the bottom right of the panel is a dropdown menu currently set to "Focused" with a downward arrow. Below the dropdown is the text "Deduplicator Algorithm" followed by a help icon.

# Deduplicator – check duplicates

The screenshot shows the Deduplicator software interface. At the top, there is a menu bar with 'File', 'Edit', 'Display Columns', and 'Help'. Below the menu bar, it displays 'Number references kept: 326' and 'Number references removed: 106'. The main area is a table of references, with columns for 'Title', 'Authors', 'Year', 'DOI', 'Journal', 'Volume', and 'Pages'. The table is divided into sections: 'Extremely Likely Duplicates (0) - [Super Quick Check]', 'Likely Duplicates (129) - [Thorough Check]', and 'Non-Duplicates (227) - [Don't Check]'. The 'Likely Duplicates' section is currently selected, showing three rows of references. Each row has a 'Keep' or 'Discard' button and a 'Not Dupe' button. A 'Split Group' button is visible at the bottom right of the table.

	Title	Authors	Year	DOI	Journal	Volume	Pages	
<input checked="" type="radio"/> Keep	No	The Swiss Narcolepsy Scale (SNS) and its short form (sSNS) for the discrimination of narcolepsy in patients with hypersomnolence: a cohort study based on the Bern Sleep-Wake Database.		<a href="https://dx.doi.org/10.1007/s00415-019-09365-2">https://dx.doi.org/10.1007/s00415-019-09365-2</a>	Journal of neurology	266	2137-2143	Not Dupe
<input type="radio"/> Discard	No	The Swiss Narcolepsy Scale (SNS) and its short form (sSNS) for the discrimination of narcolepsy in patients with hypersomnolence: a cohort study based on the Bern Sleep-Wake Database		<a href="https://dx.doi.org/10.1007/s00415-019-09365-2">https://dx.doi.org/10.1007/s00415-019-09365-2</a>	Journal of neurology			Not Dupe
<input type="radio"/> Discard	No	The Swiss Narcolepsy Scale (SNS) and its short form (sSNS) for the discrimination of narcolepsy in patients with hypersomnolence: a cohort study based on the Bern Sleep-Wake Database		<a href="https://dx.doi.org/10.1007/s00415-019-09365-2">https://dx.doi.org/10.1007/s00415-019-09365-2</a>			2137-2143	Not Dupe

Choose which to keep

Select for non-duplicates

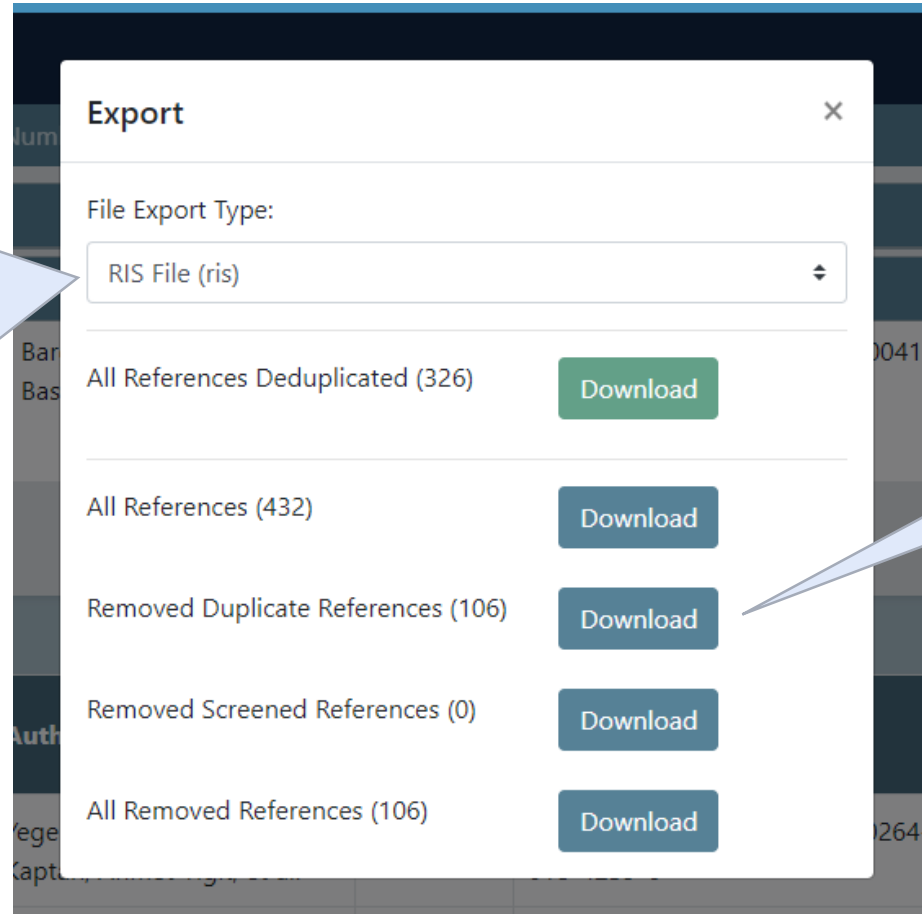
Select if several sets of different references are grouped together

Different levels of certainty

# Deduplicator – export results

Choose a file type:

- EndNote XML for EndNote
- RIS file for Covidence or Rayyan



The screenshot shows an 'Export' dialog box with a close button (X) in the top right corner. Below the title bar, there is a 'File Export Type:' label followed by a dropdown menu currently set to 'RIS File (ris)'. Below this, there are five rows of export options, each with a 'Download' button:

Export Option	Count	Action
All References Deduplicated	326	Download
All References	432	Download
Removed Duplicate References	106	Download
Removed Screened References	0	Download
All Removed References	106	Download

May want to keep duplicates as well for your records



# Deduplicator – things to note

- Make sure you save if you need to come back later – or you will lose your work!
- Make a note of the number of results from each source **before** deduplicating
- Try alternative file formats if you run into problems importing
- You may find other duplicates when screening – keep a note for your PRISMA flowchart
- No deduplication tool is perfect – the data is always messy

# Screen your results

- Try to have two people screen separately
- Covidence and Rayyan allows multiple people to screen "blind"
- Resolve your disagreements either by discussion or a third person
- Two stages:
  - Title and abstract
  - Full text
- At full text stage, record a reason for exclusion (from your exclusion criteria) for PRISMA

# Additional search methods

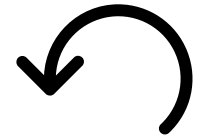
Once you've screened your search results, you will need to conduct some additional searches e.g.

- Forward & backward citation tracking
- Related articles linking
- Hand-searching conference reports & journals
- Searching trial registers
- Searching preprint archives
- Web searching
- Contacting authors, experts & organisations

# Citation tracking (snowballing)

- Once you've chosen your articles for inclusion

- Backwards – check the reference list of your articles



- Forwards – look at who has cited your articles more recently



# Citation Chaser

- Free tool, available at <https://estech.shinyapps.io/citationchaser/>
- Uses citation information from the Lens: <https://www.lens.org/>
- Very simple to upload a list of articles – use RIS file, CSV file, DOIs, PubMed IDs
- Download a RIS file of references (↻), and citations (↺).

# Using Citation Chaser

1) Upload details of included articles using these boxes

The screenshot shows the Citation Chaser web application interface. At the top, there is a navigation bar with links for Home, Article input, References, Citations, and Analysis. Below the navigation bar, the main content area contains instructions: "Enter the articles that you want to start from. We will first check the full citations in the Lens.org database. You must complete this step before retrieving references and citations." Below this, it says "EITHER:" followed by "1: Paste your identifiers in (each id separated from the next using a comma, carriage return (new line), or space)". There are six input boxes for identifiers: Digital Object Identifiers (DOIs), PubMed identifiers (PMIDs), PubMedCentral identifiers (PMcIDs), Microsoft Academic identifiers (MAGIDs), CORE identifiers (COREIDs), and Lens.org identifiers (LENSIDS). Each box contains the placeholder text "separate identifiers with a comma". Below the input boxes, it says "OR:" followed by "2: Upload your data as a CSV or RIS file". There are two file upload sections: "Choose CSV File" and "Choose RIS File", each with a "Browse..." button and a "No file selected" status. There are also "Help" buttons for each section. At the bottom, there are two buttons: "Load my input articles" (blue) and "Reset" (orange).

3) Download the references and citations from these pages

2) Load the articles

# Searching trial registers (1)

- Cochrane CENTRAL: <https://www.cochranelibrary.com/central>
  - Both published articles and trial registrations
- ClinicalTrials.gov: <https://clinicaltrials.gov/> (US trials)
- WHO ICTRP: <https://trialsearch.who.int/Default.aspx> (pulls together records from many national trial registers)

# Searching trial registers (2)

- WHO ICTRP and ClinicalTrials.gov have less sophisticated search functions than databases
- Trial registrations may have limited information (they are a plan of a trial rather than a full journal article)
- It is important to search these (if trials are relevant to your question) because:
  - Some trials with negative/inconclusive results never get published
  - Some trials cannot be properly completed because of participants dropping out, lack of funding, etc.
  - Systematic reviews should still mention these trials



# Web searching via Google

- Did you know that Google has an advanced search?
- You can use it to search by file type (PDF) and by a particular domain (.nhs.uk, .gov.uk, .de, .org...)
- [https://www.google.com/advanced\\_search](https://www.google.com/advanced_search) (or click the cog and Advanced Search from the normal search results page)

# Filtering Google results

Then narrow your results by...

language:	<input type="text" value="any language"/>	Find pages in the language that you select.
region:	<input type="text" value="any region"/>	Find pages published in a particular region.
last update:	<input type="text" value="anytime"/>	Find pages updated within the time that you specify.
site or domain:	<input type="text" value=".nhs.uk"/>	Search one site (like wikipedia.org ) or limit your results to a domain like .edu, .org or .gov
terms appearing:	<input type="text" value="anywhere in the page"/>	Search for terms in the whole page, page title or web address, or links to the page you're looking for.
file type:	<input type="text" value="Adobe Acrobat PDF (.pdf)"/>	Find pages in the format that you prefer.
<a href="#">usage rights:</a>	<input type="text" value="not filtered by licence"/>	Find pages that you are free to use yourself.

[Advanced Search](#)

# Reporting your search

- Include a summary of the search methods in the body of your review
- Include the numbers in a flow chart
- Include a full copy of the exact search strategies for all databases in an appendix
- Comply with [PRISMA-S](#)

# Further help

- Contact us for one-to-one help
  - [hcl-enquiries@bodleian.ox.ac.uk](mailto:hcl-enquiries@bodleian.ox.ac.uk)
- LibGuides
  - [Systematic Reviews](#)



# Questions

