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Literature and Systematic Review: Do it right the first time

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Webinar Instructions

Mute Your Microphone at all times

Introduce yourself on the chat box with Name, Country

All Questions will be taken at the end of the Speakers Presentation – Kindly type all questions in the chat box during the presentation

Fill in the evaluation form at the end of webinar: Only those who fill the post webinar evaluation form will get a Certificate at the end of the webinar

Introduction of Speaker

Ms. Renly Lim is a **pharmacist** and **a research fellow** at the Quality Use of Medicines and Pharmacy Research Centre at the University of South Australia, Adelaide.

Renly was born and grew up in Malaysia. She completed her pharmacy degree in Scotland, her PhD in Malaysia, and has work experience in the UK, Malaysia, Thailand and Cambodia.

She is the University of South Australia Early Career Representative and currently the President-Elect of the International Pharmaceutical Federation (FIP) Young Pharmacists' Group.

Her research interest includes medication safety, digital health, health program evaluation and community engagement.

Content

Basics

How to

Useful resources

Q&A

The Basics

What is the literature?

Primary source

- Original research, conference papers, interviews, raw data, reports

Secondary source

- Reviews, commentaries, opinion pieces, books

Tertiary source

- Based on primary and secondary sources e.g. handbooks, guidelines, standards

The Basics

Review

- Secondary source; do not report new or original experimental work

Literature review

- Provide summary or overview of a topic (general or specific)

Systematic review

- Comprehensive review which synthesizes ALL research evidence relevant to the specific topic of interest
- Clear objectives identified; explicit and reproducible search strategy

Laborious task!

What's out there

Elsevier (2015)

- 1.8 million unique authors submitted **1.3 million manuscripts** (estimated 7.8 million active researchers in 2015)
- **400,000 manuscripts published** in 2,500 active journals

Benefits

- Gain **deeper understanding** in your field of interest
- Identify **relevant journals** if working on research project
- Get insight into **current trends** and identify **opportunities**
- Conference **abstracts**, peer-reviewed **publications**
- **Grant proposals** for funding application

Hierarchy of evidence

Before you start

Things to keep in mind

- Start with the question
- Scope of project
- Time
- Resources
- Conference/publication

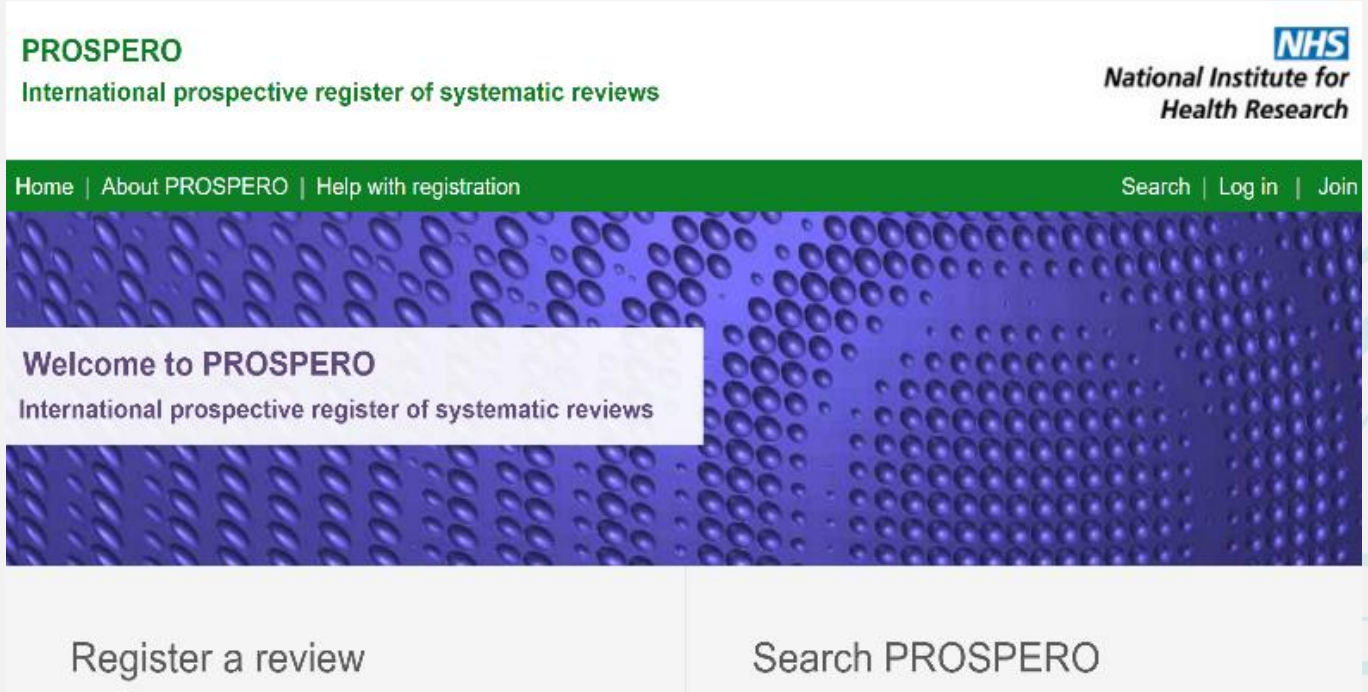
How to

Once you know your question…..

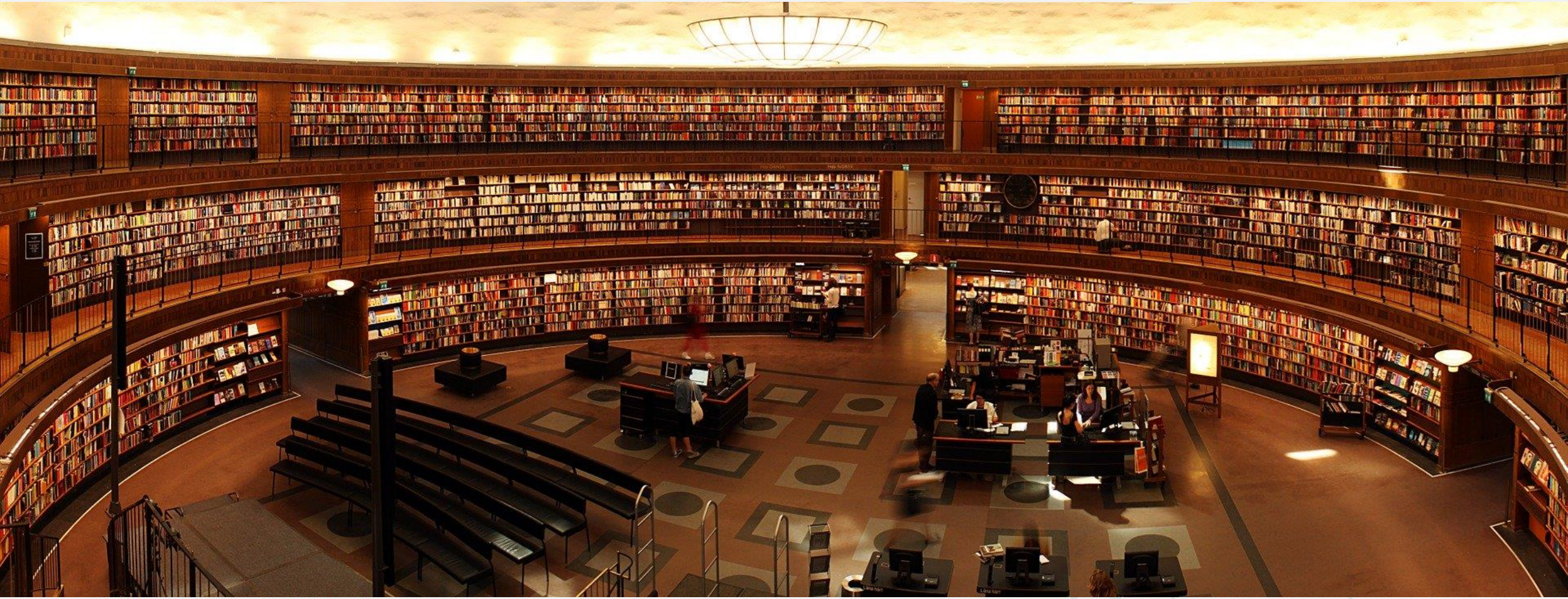
- **Systematic review** - Done according to a fixed plan or system
- **Protocol**
    - Formulate the question – focused, plan the review
    - Eligibility criteria – method, population, design
    - Comprehensive search – search strategy, search terms
    - Selection and extraction
    - Critical appraisal
    - Data synthesis (including meta-analysis)
    - Interpretation of results and writing up
- **Comprehensive, reproducible, transparent**

Protocol registration e.g. PROSPERO

- Search for ongoing reviews
- Register planned review online (& update as work progresses)
- Avoids duplication of reviews



Comprehensive search



Where to search?

Electronic databases according to the topic area

- MEDLINE, EMBASE, Cochrane databases, PsycInfo, etc.

Grey literature

- dissertations, theses, conference proceedings, national bodies, government reports, census, books etc

Clinical trial database (www.clincialtrials.gov/)

Check existing systematic reviews in a similar area for ideas

Comprehensive search – Search terms

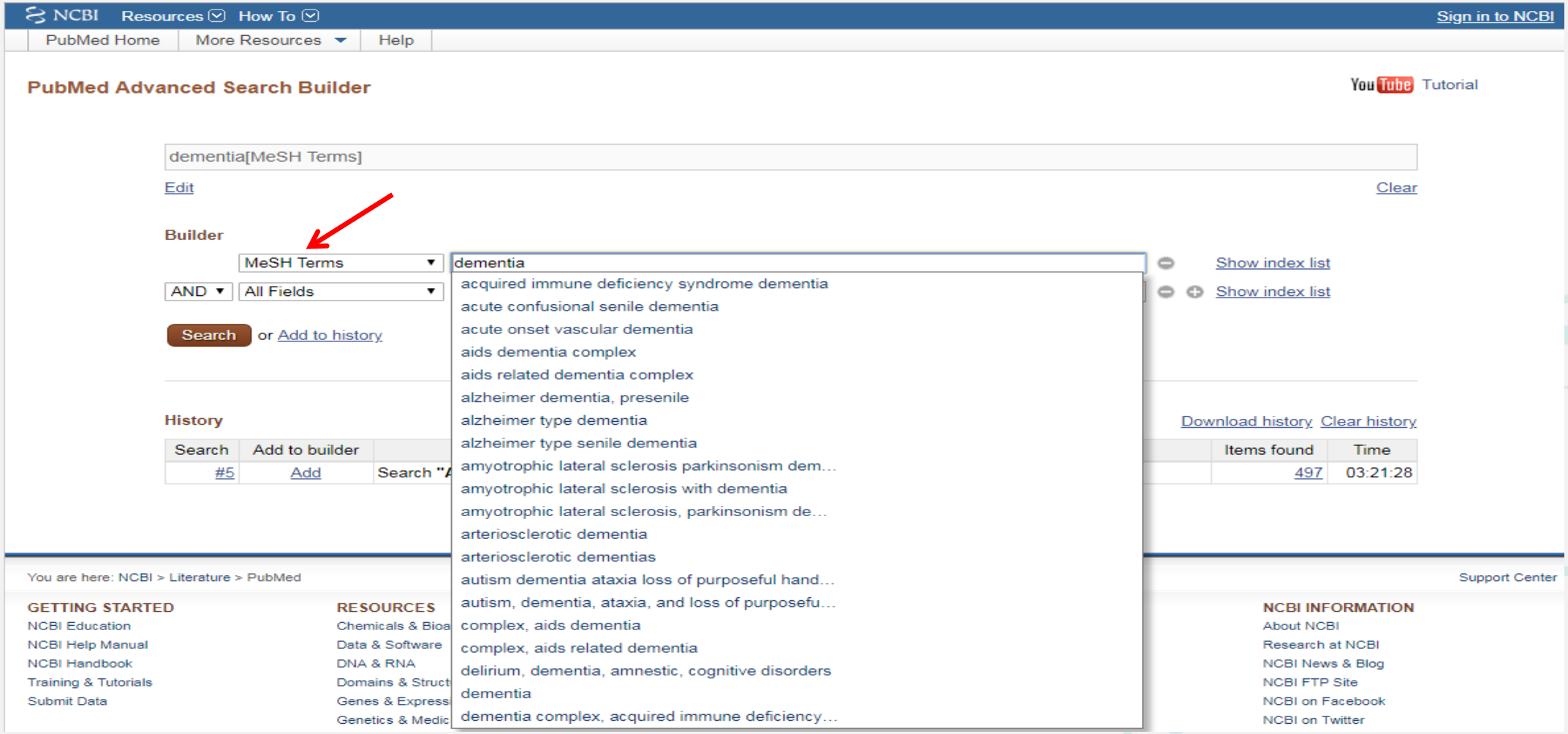
- Broad but defined, systematic sweep
- Compile a list of search terms for **each** component
    - Words and phrases that are related
    - Words that are broader
    - Words that are more focused

Comprehensive search – Search terms

Thesaurus headings (e.g. MeSH in Medline)

- Controlled vocabulary thesaurus used for indexing articles
- Standardised search terms regardless of how author has described the study
- Each database has a different thesaurus – must translate

Comprehensive search – Search terms



Comprehensive search – Search terms

Keywords

- Also search title and abstract fields in case of imprecise or non existent indexing

Truncated search words and wild cards (*, $, ?, #)

- Medic* = medication, medicine, medicines

Boolean logic

- Use OR, NOT, AND to be specific in search

e.g. dementia NOT stroke

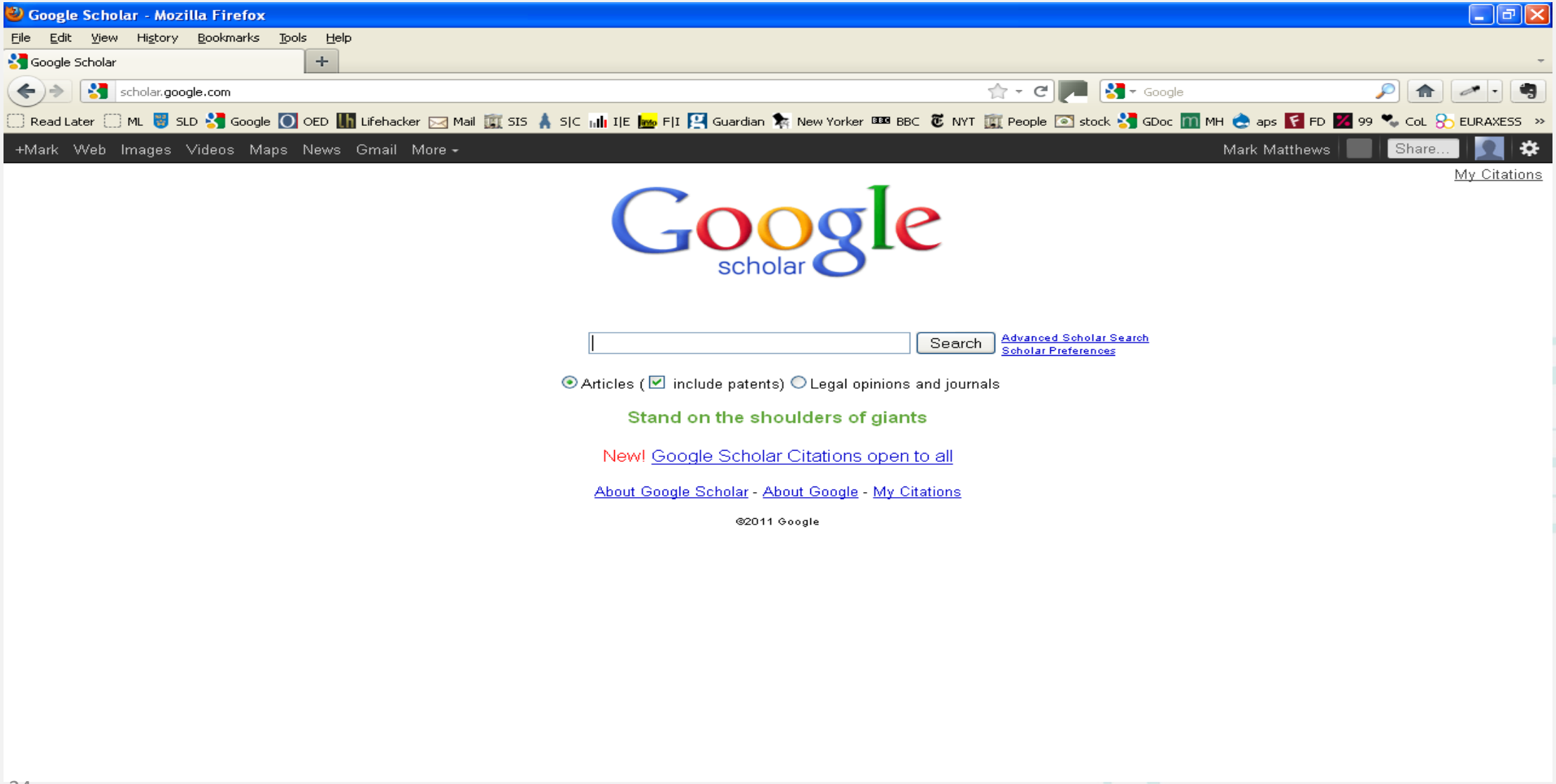
Comprehensive search – Search terms

Different databases use different types of controlled vocabulary

- Same citations indexed differently on different databases
- Medline and EMBASE use a different indexing system for study type
- PsycINFO does not have specific terms to identify study types

→ **Need to develop search strategy for each database**

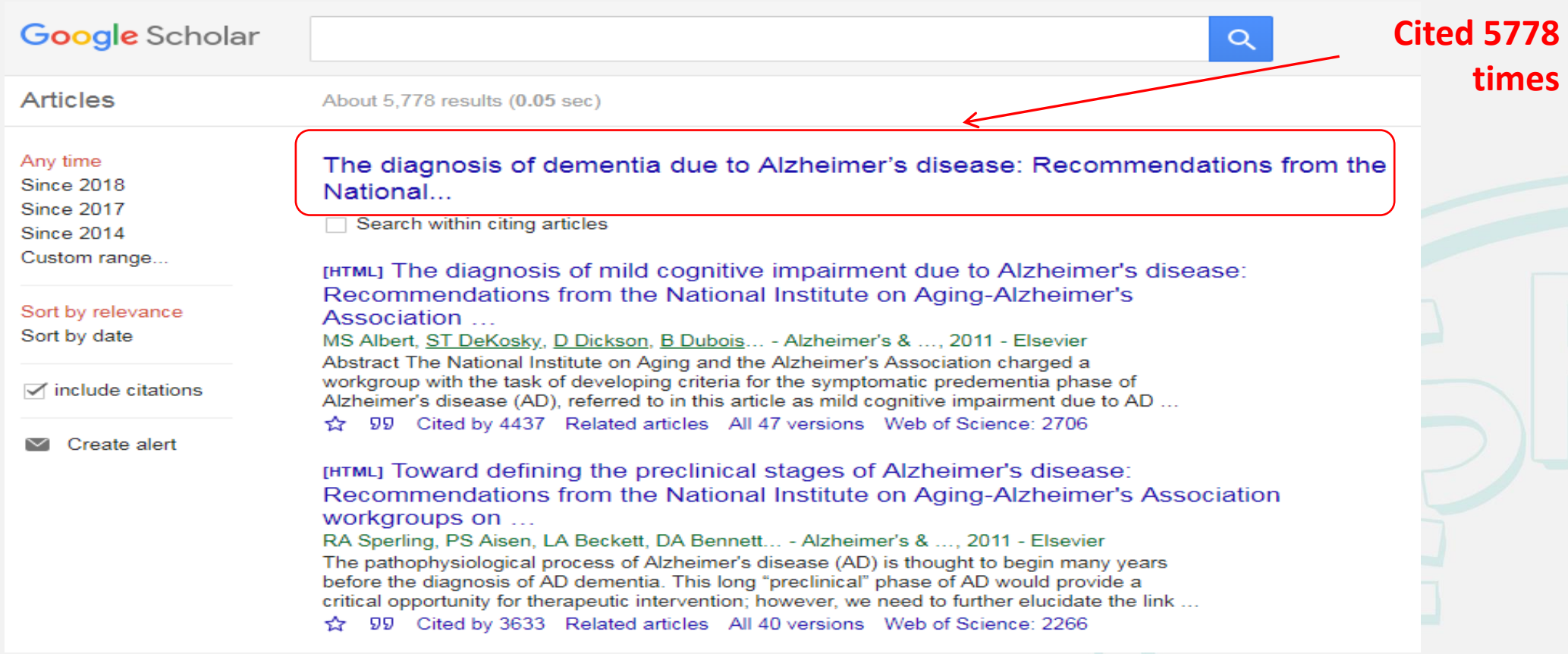
Cheat sheet



Cheat sheet

Look for popular article - citations

Relevant articles



Where to download?

- Online library
- Hard copies of books and journals
- Interlibrary loan
- Online search - Google scholar, ResearchGate
- Contact author

Save your references!

- Keep a record of the literature you collect
- Use a citation manager program like RefWorks or EndNote
- Record **when** you did the search
- Record **where** you retrieved the information

Search Log

Date	Database	Keywords	Results
10/3/2020	Medline	Dementia, nursing home, medicine error etc	479 articles
10/3/2020	Embase		2173 articles
10/3/2020	Scopus		557 articles

Selection and extraction

Title screening

Pilot a data extraction form

- Two independent persons extract data

Collect the following information

- Citation details to identify the study
- Characteristics of population/intervention
- Methodological details according to chosen critical appraisal tool
- Study outcomes

Selection and extraction

Extract sufficient information

- to describe studies
- to allow you to undertake the planned analysis
- so you do not need to return to the full text papers

But not too much

- Don’t waste time extracting ‘nice to have’ but unnecessary detail

Critical appraisal

Not all published and unpublished literature is of satisfactory methodological rigour

- Just because it is published in a peer-reviewed journal does not mean it is sound!

Quality may be used as an explanation for differences in study results

Guide the interpretation of findings and aid in determining the strength of inferences

Critical appraisal

Quantitative studies

- Internal validity
- Bias: selection; performance; detection; attrition; reporting
- External validity

Better to use domain based assessment not numerical scores

- Cochrane Risk of Bias 2.0 – RCTs (Higgins 2016)
- QUADAS 2 – diagnostic accuracy (Whiting 2006)
- ROBIS for systematic reviews (Whiting 2016)

Data synthesis

Results from different studies types need to be synthesised appropriately

Quantitative data

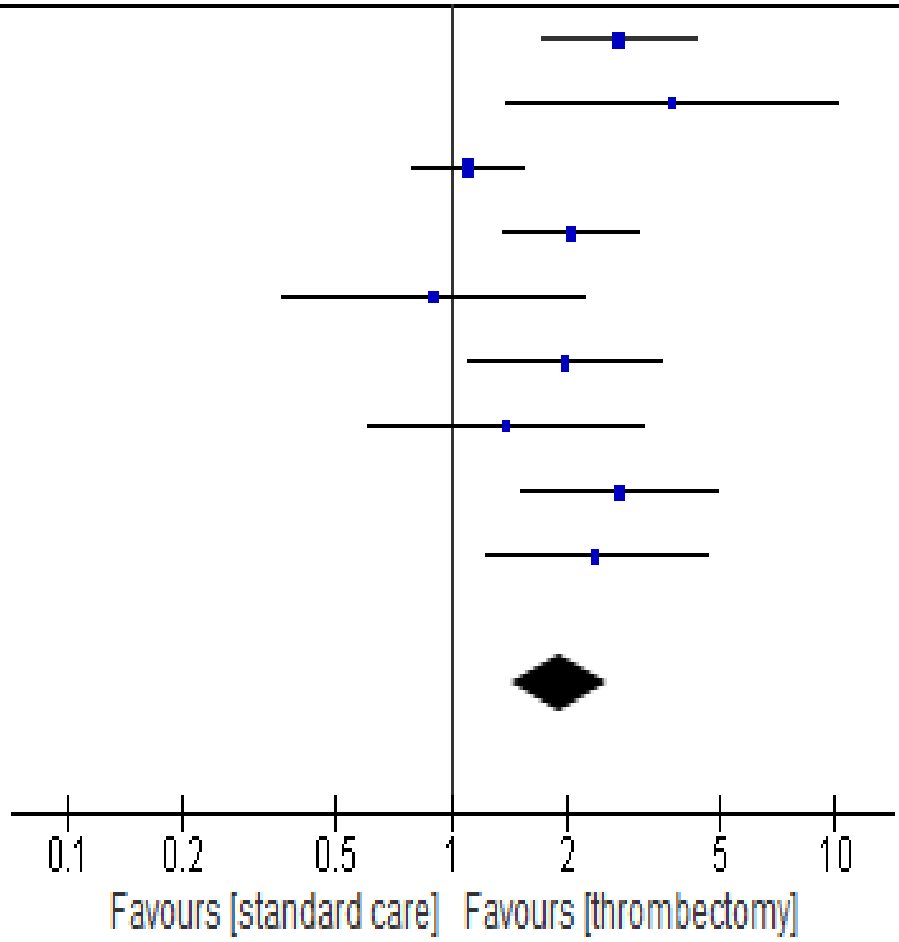
- Tables to compare
- Descriptive synthesis
- Meta-analysis (if enough homogeneity in interventions/ outcomes/ study designs)

Data synthesis

Study or Subgroup	Thrombectomy Events	Thrombectomy Total	Standard Care Events	Standard Care Total	Weight	Odds Ratio M-H, Random, 95% CI
ESCAPE 2015	87	164	43	147	13.8%	2.73 [1.71, 4.37]
EXTEND 2015	25	35	14	35	6.2%	3.75 [1.38, 10.17]
IMS 3 2013	177	415	86	214	16.6%	1.11 [0.79, 1.55]
Mr Clean 2015	76	233	51	267	15.0%	2.05 [1.36, 3.09]
Mr Rescue 2013	12	64	11	54	7.1%	0.90 [0.36, 2.25]
REVASCAT 2015	45	103	29	103	11.7%	1.98 [1.11, 3.53]
SWIFT L 2012	20	55	14	48	8.0%	1.39 [0.61, 3.18]
SWIFT P 2015	59	98	33	93	11.6%	2.75 [1.53, 4.94]
TREVO 2 2012	34	85	19	87	10.2%	2.39 [1.22, 4.66]
Total (95% CI)		**1252**		**1048**	**100.0%**	**1.91 [1.42, 2.58]**
Total events	535		300			

Heterogeneity: Tau² = 0.11; Chi² = 18.95, df = 8 (P = 0.02); I² = 58%

Test for overall effect: Z = 4.28 (P < 0.0001)



Writing up - PRISMA checklist

To ensure you have covered all the points in conducting a systematic review

→ compare what you plan to do against the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA)

→ PRISMA checklist (previously QUOROM)

Interpretation of results & writing up

- Write methods clearly – replicable
- Organise results in a logical flow
- Discuss what has been published
- What's the conclusion
- Proof read and revise

Useful resources

Resources to get you started:

- University of South Australia guide on systematic review https://guides.library.unisa.edu.au/c.php?g=524373&p=6337522
- Pubmed Tutorial https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/020_700.html
- Cochrane Training https://training.cochrane.org/handbooks
- PRISMA checklist http://prisma-statement.org/PRISMAStatement/Checklist
- University librarian!

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Systematic Reviews

This guide was developed with the assistance and expertise of Dr Anna Phillips, Dr Saravana Kumar, and Dr Shylie Mackintosh, from the UniSA School of Health Sciences.


Systematic Review Overview


Define Question


Protocol


Search


Screen


Critical Appraisal


Data Extraction


Data Synthesis

Other review types

What review to choose?

Choose carefully the review type that will match the purpose and scope of your research. It is vital you have a clear understanding of what is involved when undertaking a particular type of review.

Follow relevant standards and adhere to best practice methods as outlined in this guide

	Scoping Review	Systematic Review	Narrative Literature Review
What is it?	Rapid gathering of literature in a given policy or clinical area where the aims are to accumulate as much evidence as possible and map the results and provide an overview of the type, extent and quantity of research available on a given topic.	Attempts to identify, appraise and synthesize all empirical evidence that meets pre-specified eligibility criteria to answer a given research question. Uses explicit, reproducible methods aimed at minimizing bias, to produce reliable findings and inform decision making.	Synthesises the findings of literature retrieved from searches of computerised databases, hand searches, and authoritative texts
Why choose?	Capture breadth instead of depth of literature; identify gaps within the research area; occasionally used as a precursor to a systematic review.	To address a clearly focused review question by finding the best available, relevant research studies and synthesizing the results.	Often part of a bigger project/thesis. Used to set the scene for the research.
Question	Often broad e.g. trying to find out what is already known about a topic. However, there is also scope to have a pre-conceived question to assess what literature is available around the subject	Focused on a single topic.	May start with a clear question to be answered, but they more often involve general discussion of a subject with no stated hypothesis; i.e., a topical approach.
Sources / Search	Ideally, a protocol or plan is included. Clear objectives are identified. Comprehensive sources and explicit and reproducible search strategy. Use of a wide range of resources, including black and grey literature, of any study type.	A peer review protocol or plan is included. Clear objectives are identified. Comprehensive sources and explicit and reproducible search strategy. Use of a wide range of resources, including black and grey literature. Often a focus on randomised controlled trials.	Does not attempt to locate all relevant literature in a systematic, reproducible way. Search strategy, if presented, may be described in broad terms.

It is worth doing?

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Established in 1949, IPSF is the leading international advocacy organisation for pharmacy and pharmaceutical science students and recent graduates that promotes improved public health through the provision of information, education, networking, and a range of publications and professional activities.

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Any Questions?

The Young Researchers Forum - Call for Research Working Groups

Research topics:

1. The impact of climate change on Drugs
2. The extent of substandard and falsified medicines and strategies.
3. Other research topics depending on your interest, currency and global relevance

It is an opportunity to apply the knowledge you have learnt today

Appy through : https://forms.gle/RXQeefJpngLBWMH5A

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