

# Literature searching with the Cochrane Library

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## **Overview**

- Who or what is Cochrane?
- Systematic Reviews
- Formulating a PICO question
- cochrane.org vs. cochranelibrary.com
- Databases in the Cochrane Library
- Advanced Search
  - Search, search manager, MeSH
  - Proximity operators
  - Truncation
- Search management
- Exercise 😭



## Cochrane

## **Archibald Leman Cochrane**

"It is surely a great criticism of our profession that we have not organized a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomized controlled trials."

1979



Source: A. Blümle, Deutsches Cochrane Institut, Freiburg



For anyone interested in high-quality information to make health care decisions, e.g. doctors, nurses, patients, care-takers, researchers, funders

#### **Objectives:**

- To generate and advocate accessible evidence
- To create an effective and sustainable organisation

#### **Products/Services:**

- Write, update and disseminate Cochrane Reviews
- Maintain Cochrane Library
- Cochrane Response: evidence service for a fee
- Learning products: Interactive learning about systematic review processes
- Review Tools
  - RevMan (software for preparing and maintaining Cochrane Reviews)
  - Covidence (screening and extraction tool)

## **Systematic Reviews**

Term for systematic, quality-assessed, and synthesized presentation of study results

#### Individual steps of a Systematic Review:

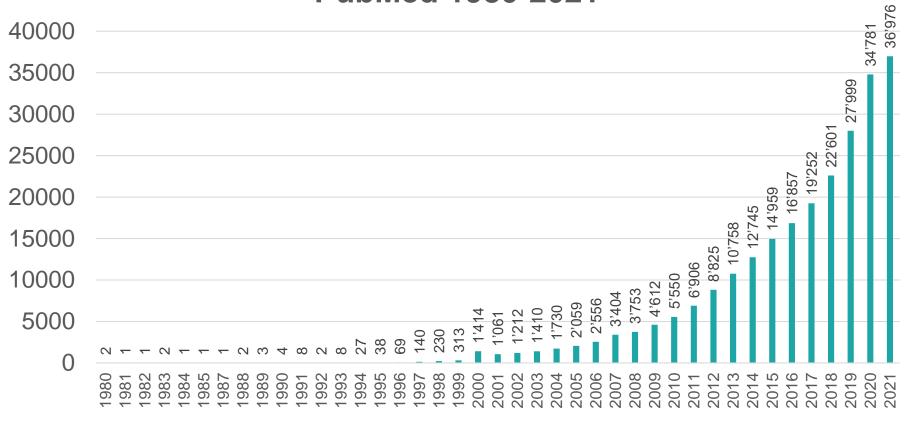
- Defining scientific question, determine inclusion/exclusion criteria
- Searching studies/evidence
- Selecting studies/evidence, and extracting data
- Assessing risk of bias of included studies
- Synthesis of results, meta-analysis
- Addressing reporting bias if necessary
- Preparing results (e.g. summary of findings table)
- Interpreting results and drawing conclusions

**Cochrane Reviews** are systematic reviews that follow the methodology specified in the **Cochrane Handbook** (<a href="https://training.cochrane.org/handbook/current">https://training.cochrane.org/handbook/current</a>)

Further review types in the appendix

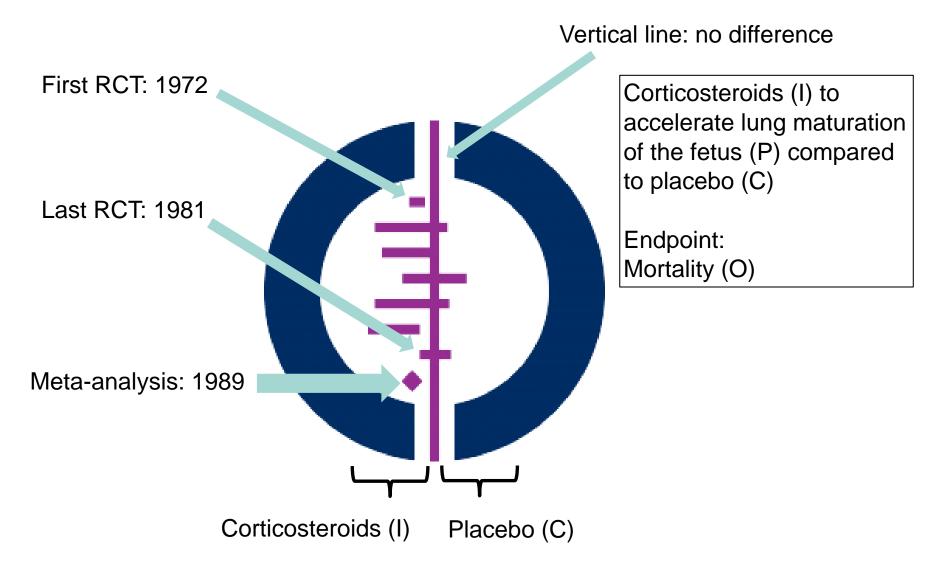
## **Number of Systematic Review publications**

## Number of published systematic reviews in PubMed 1980-2021



Source: PubMed Trends

## The Cochrane Logo, a forest plot



Source: A. Blümle, Deutsches Cochrane Institut Freiburg

## **Exercise 1: PICO**



Timon is 10 years old and obese. His doctor wants to prescribe an intervention to stabilize his weight. However, she is not sure which type of intervention is better, one with the child alone (without the parents) or one with the parents alone (without the child).



https://youtu.be/57jEMZ87ND8

## **Exercise 1: PICO**



#### Case study:

Timon is 10 years old and obese. His doctor wants to prescribe an intervention to stabilize his weight. However, she is not sure which type of intervention is better, one with the child alone (without the parents) or one with the parents alone (without the child).

#### **Exercise 1:**

What are the PICO concepts of this case and what is the PICO question?

Po	pu	lat	ion	:

Intervention:

Control:

Outcome:

#### **PICO Question:**

## **Cochrane vs. Cochrane Library**

#### www.cochrane.org

- Freely accessible
- Access to Summaries of Cochrane Reviews for patients and laypersons; mostly in English and Spanish, other languages available



Trusted evidence.
Informed decisions.
Better health

#### www.cochranelibrary.com

- Fee-based
- Cochrane Reviews published after February 2013:
  - Full texts free of charge 12 months after publication (access e.g. via PubMed if no Cochrane Library licence)
- Swiss national licence since 2016:
  - free access for users throughout Switzerland



Trusted evidence. Informed decisions. Better health.

## **Cochrane Kompakt (German)**



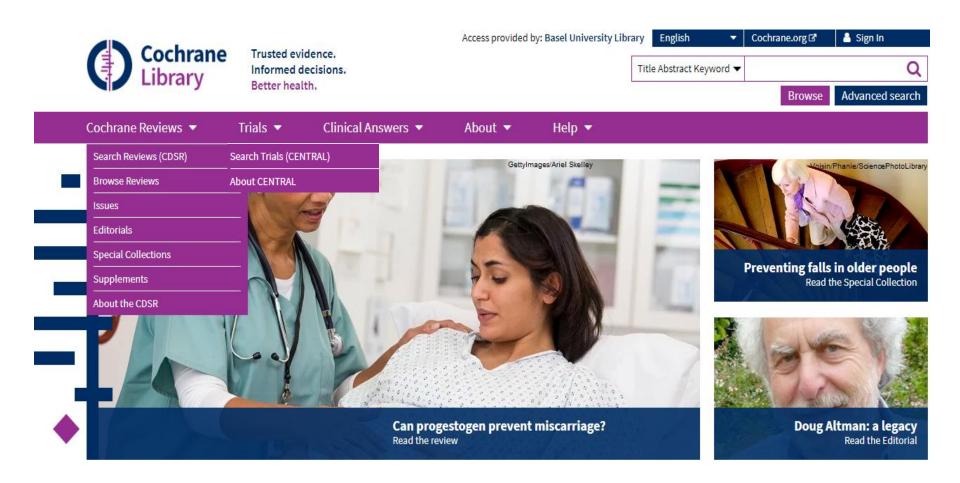
Zuverlässige Evidenz. Informierte Entscheidungen. Bessere Gesundheit.

## https://www.cochrane.org/de/evidence

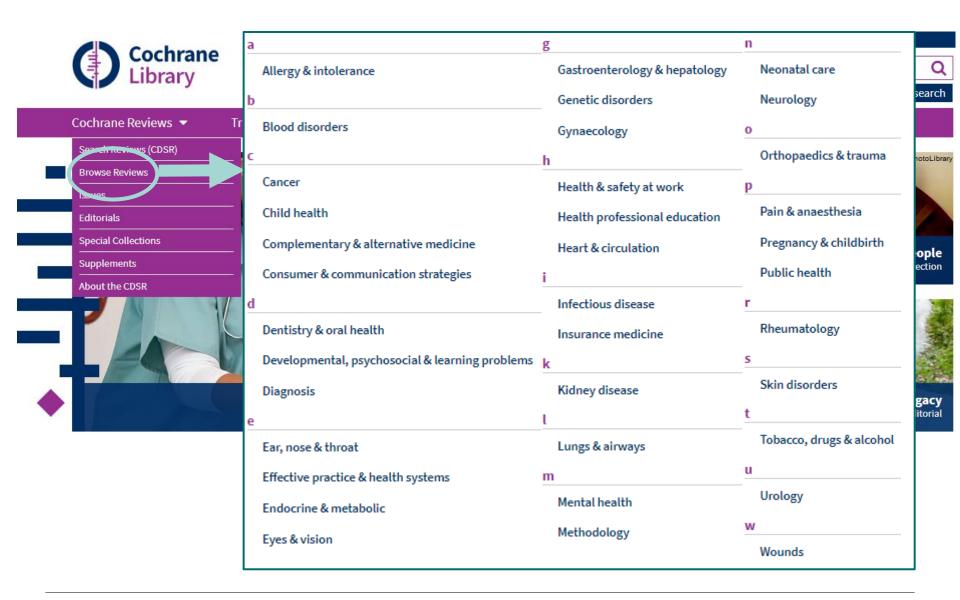
More than 2100 Cochrane review summaries in lay German

- Cochrane Evidence Essentials 🖸 ein kostenloses Online-Programm als Einführung in die Gesundheitsevidenz und wie man sie nutzen kann, um fundierte Entscheidungen im Gesundheitsbereich zu treffen
- Ausgewählte Reviews erfahren Sie mehr über die aktuellste Cochrane-Evidenz mit Links zu den Zusammenfassungen in einfacher Sprache und vollständigen Reviews.
- Podcasts hören Sie sich die aktuellste Cochrane-Evidenz in einem einfach zugänglichen Audioformat an, das Ihnen erlaubt, auf dem neuesten Stand der zuletzt veröffentlichten Reviews zu bleiben, egal wo Sie sind
- Bei Cochrane mitmachen ☑ erhalten Sie unseren monatlichen Newsletter und entwickeln Sie neue Fähigkeiten und Interessen
- Cochrane Training 🖸 erfahren Sie mehr über unsere Lernmaterialien und die Schulungen, die wir anbieten
- Cochrane Consumer Netzwerk ☑ für Patienten, Angehörige und alle, die an hochwertiger Evidenz und ihrer Erstellung interessiert sind
- Testing Treatments interactive ☑ lesen Sie, warum es wichtig ist, dass Behandlungen sorgfältig untersucht werden. Ein kostenloses E-Book
- Students 4 Best Evidence ist eine Online-Community für Studenten, die an evidenzbasierter Gesundheitsversorgung interessiert sind, mit nützlichen Ressourcen.

## http://www.cochranelibrary.com/



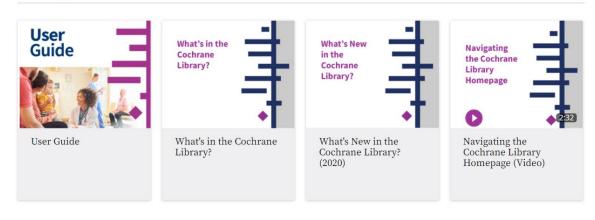
## **Cochrane Library – Browse Reviews by topic**



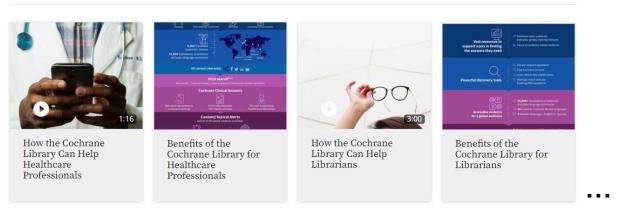
## **Cochrane Library Training Hub**

## https://www.wiley.com/network/cochranelibrarytraining

**Getting Started** 



#### Becoming an Expert



## **Content of Cochrane Library**



Trusted evidence. Informed decisions. Better health.

## **Cochrane Database of Systematic Reviews (CDSR)**

- All Cochrane Reviews and Protocols
- Editorials and supplements linked to specific Cochrane Reviews

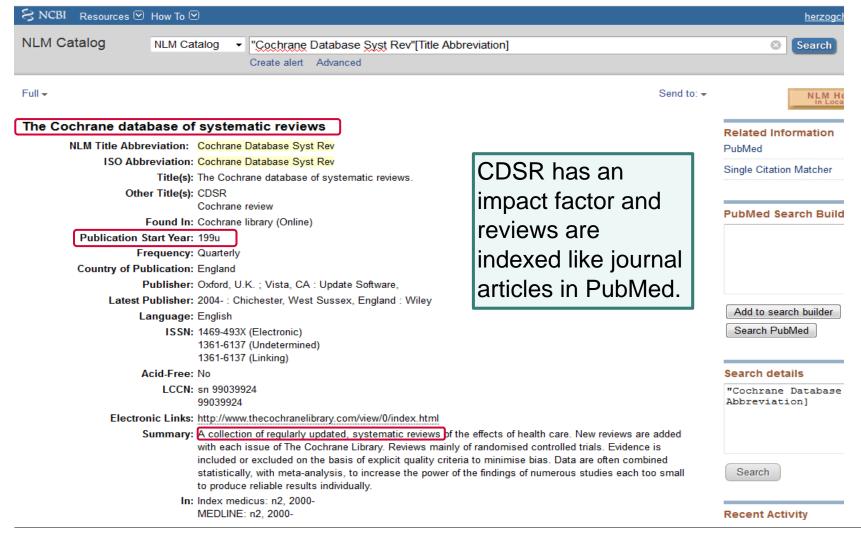
#### **Cochrane Central Register of Controlled Trials (CENTRAL)**

- Mainly trials from PubMed and Embase
- Some data from other published / non-published sources, including ClinicalTrials.gov.
- https://www.cochranelibrary.com/central/central-creation

## **Cochrane Clinical Answers (CCAs)**

Easy-to-understand clinical questions and answers

## **Cochrane Database of Systematic Reviews (CDSR)**



## CENTRAL (Cochrane Central Register of Controlled Trials)

- Created as a repository for all citations to trials identified by Cochrane
- Contains predominantly randomized and quasi-randomized controlled trials
- Contains records from
  - PubMed, Embase (majority)
  - CINAHL
  - ClinicalTrials.gov
  - International Clinical Trials Registry Platform (ICTRP) of the WHO
  - Trials included in published Cochrane reviews
  - Specialized registries of the Cochrane Review Groups and handsearches
  - KoreaMed (08/2017 03/2021)
- Updated monthly
- Only citations and abstracts, no full texts



## Cochrane Library – Cochrane Clinical Answers (CCA)



- Clinical questions and answers easy to read
  - tabular form in PICO format
  - with risk of bias assessment and links to graphics
  - facilitates decision making
- Each clinical question is based on a Cochrane Review (a very broad review could be the template for multiple CCAs)
- Not included: Very specific topics; "not relevant" comparisons and outcomes (according to CCA editor, reviewed by clinicians)
- Updates analogous to the Cochrane Reviews

## Brief orientation on the websites

www.cochrane.org



Trusted evidence. Informed decisions. Better health.

www.cochranelibrary.com



Trusted evidence. Informed decisions. Better health.



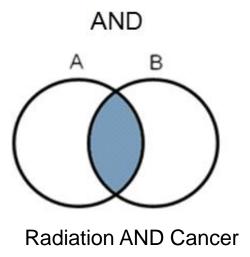
e.g. Browse by Topic

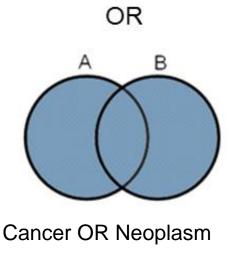
## **Boolean operators**

AND = both search terms occur

OR = at least one of the two search terms occurs

NOT = without this search term





Attention: 'NOT' usually leads to unwanted exclusions. Best to contact an information specialist

## **Boolean operators: Combining the PICO aspects**

#### P AND I AND C AND O

or with synonyms:

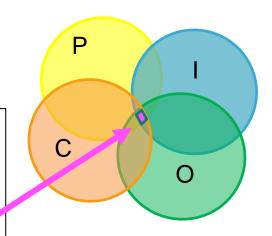
(Population 1 OR Population 2 OR ...) AND

(Intervention 1 OR Intervention 2 OR ...) AND

(Control 1 OR Control 2 OR ...) AND

(Outcome 1 OR Outcome 2 OR ...)

Intersection = final search results



**Note:** Not all aspects of the PICO question need to be included in a search.

- → Initially only search for a few and clearly describable aspects (e.g. drugs)
- → Outcomes often not mentioned in the abstract. Therefore omit them if possible

## **Boolean Operators: Combining the PICO aspects**

- Be mindful of the brackets!

(P1 OR P2) AND (I1 OR I2)

With brackets: Commands in brackets are executed first ("nesting")

(Population 1 OR Population 2) AND

(Intervention 1 OR Intervention 2)

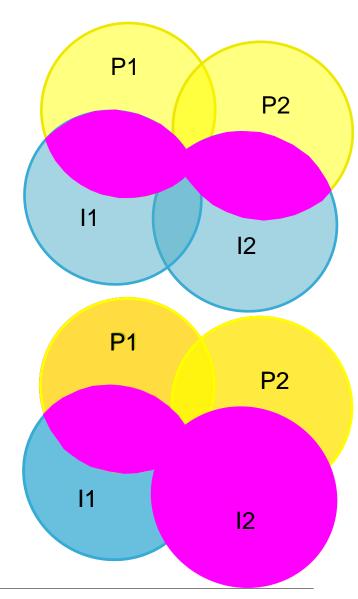
= final search results 1

Without brackets: Commands will be executed strictly rom left to right

Population 1 OR Population 2 AND

**Intervention 1 OR Intervention 2** 

= final search results 2



## **Search features: Proximity operators**

#### **NEXT**

- Finds words that are next to each other (only in this order)
- Identical to phrase search
  - Example: lung NEXT cancer = "lung cancer" (finds lung cancer, but not cancer lung)

#### **NEAR**

- Finds words that are next to each other within 6 words (order does not matter)
  - Example: lung NEAR cancer
     (finds lung cancer as well as cancer of the lung among others, but not This type of cancer is very aggressive and usually found in the lung.)

#### **NEAR/X**

- Like NEAR, but the distance to the next word (X) is freely selectable
  - Example: lung NEAR/3 cancer
     (finds lung cancer and cancer of the lung, but not
     This cancer, typically found in the middle lobe of the lung. >> near/9)

## Search features: Truncation (wild cards)

- \* Replaces none, one or more letters or characters
- ? Replaces none or only one letter or character
- Truncation can be placed at
  - at the beginning of a word
    - \*glycemia → hyperglycemia, hypoglycemia
  - in the middle of a word
    - ✓ leuk\*mia, leuk?emia → leukemia, leukaemia
    - √ wom?n → women, woman
  - At the end of a word (in PubMed only at the end of a word):
- Truncations in phrases not possible! Use NEXT:
  - "Hematopoietic stem cell\*" => (Hematopoietic NEXT stem NEXT cell\*)

## **Exercise 2: Text words**



In overweight or obese children, are parent-only or child-only interventions more effective to stabilize the weight?

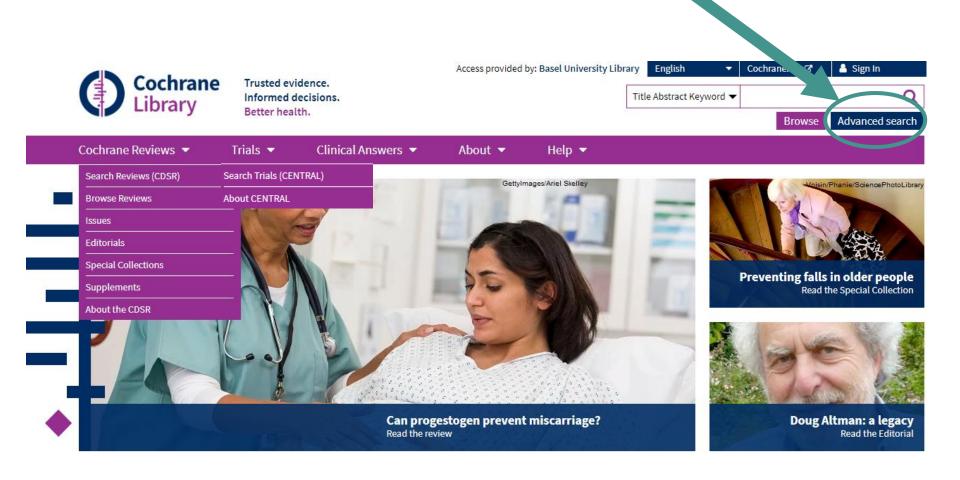
#### Task:

Find appropriate text words for each PICO aspect. Use Boolean and proximity operators to connect the text words within a PICO aspect. Also use truncation.



https://youtu.be/57jEMZ87ND8

## **Cochrane Library – Advanced Search**



## Cochrane Library – Advanced Search Three search options at a glance

#### **Advanced Search**







? Search help

#### **Search:** For simple searches.

- Synonyms are automatically searched for
- Limited to certain field codes
- Auto Suggestion Tool (search suggestion when typing)

## Search Manager: For complex, structured searches.

- Use of Boolean operators,
- proximity operators,
- field codes, and wildcards

MeSH Search: For highly specific searches with controlled medical vocabulary (MeSH Thesaurus)

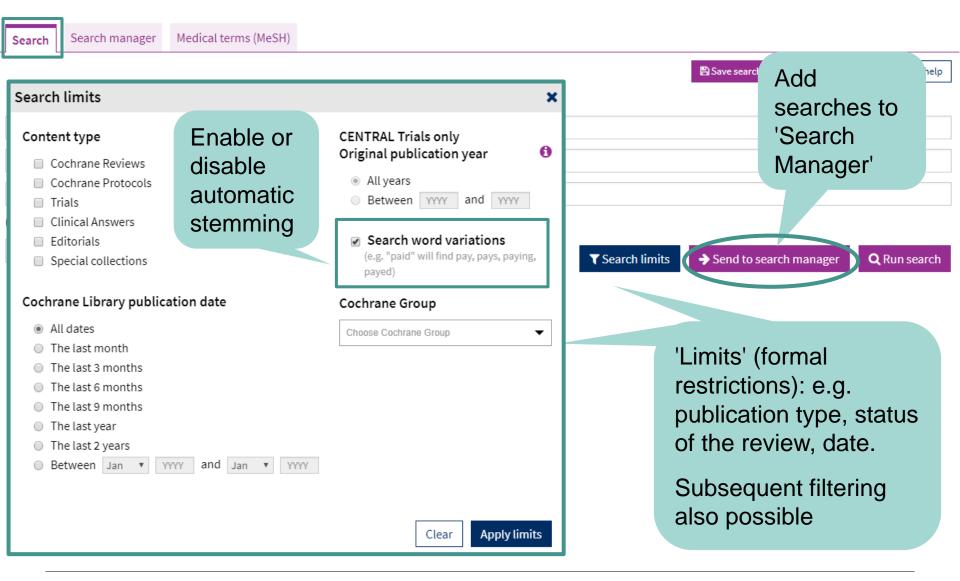
PICO Search: Special term search for specific PICO aspects

## Cochrane Library - Advanced Search 'Search'



- Word Variations: Causes automatic truncation, i.e. word variants are found
- If several terms are entered in one line, they are linked with AND.
  - Exception: Phrase search (e.g. "heart disease") or active linking with OR (e.g. "heart disease" OR "myocardial ischemia")
- Multiple lines: Can be combined with Boolean operators
- Field codes: Title/Abstract/Keyword, Author, Publication Type, All Fields, ....
- Send to Search Manager: Create more complex searches there

## Cochrane Library - Advanced Search: 'Search'



## Exercise 2a



- 1. Go to Advanced Search, click on Search
- 2. Select **Title Abstract Keyword** from the drop down list
- 3. Click on **Search limits**, uncheck the Search word variations box
- 4. Enter your solution for **population** (copy & paste)
- 5. Click send to search manager
- 6. Repeat the process for your intervention terms

Patient	(p?ediatric OR child* OR kid OR kids ) NEAR/3 (overweight OR obese OR obesity OR adipose OR adiposity)
Intervention	(parent? OR mother? OR father? OR caretaker?) NEAR/2 (only OR focus* OR centered OR centred OR just OR alone OR based OR directed)

## Cochrane Library – Advanced Search: 'Search Manager'



- Create complex search strategies
- Use Boolean operators, proximity operators, field codes and wildcards
- Edit and link individual searches
- Search MeSH terms via the MeSH database
  - → add them to the Search Manager

## Exercise 2b



- 1. Go to Advanced Search, click on Search manager
- 2. Click on the drop down S
- 3. Select Title Abstract Keyword
- 4. Enter your solution for **Control** (copy & paste)
- 5. Click Add / Edit search line
- 6. Repeat the process for your terms for Outcome

Control	(child* OR kid OR kids OR boy? OR girl? OR schoolchild*) NEAR/2 (only OR focus* OR centered OR centred OR just OR alone OR based OR directed)
Outcome	(reduce OR reduction OR stabili?e OR stabili?ation OR control* OR manage*) NEAR/3 (weight OR BMI OR 'body mass index' OR (body NEXT fat))

## Cochrane Library - Advanced Search: 'MeSH'

Search manager Medical terms (MeSH)

## **Medical Subject Headings (MeSH):**

- Standardised vocabulary (= thesaurus) with which articles are indexed
- Describes the content of articles (independent of terms and spellings in the title/abstract of the article)
  - o probability of hits ↑
- Corresponds to the MeSH terms of the Medline database
- Hierarchical tree structure (MeSH Tree)
  - Automatic inclusion of all narrower MeSH terms in the MeSH tree (= term explosion)
  - o suppressible: articles with narrower terms are not found

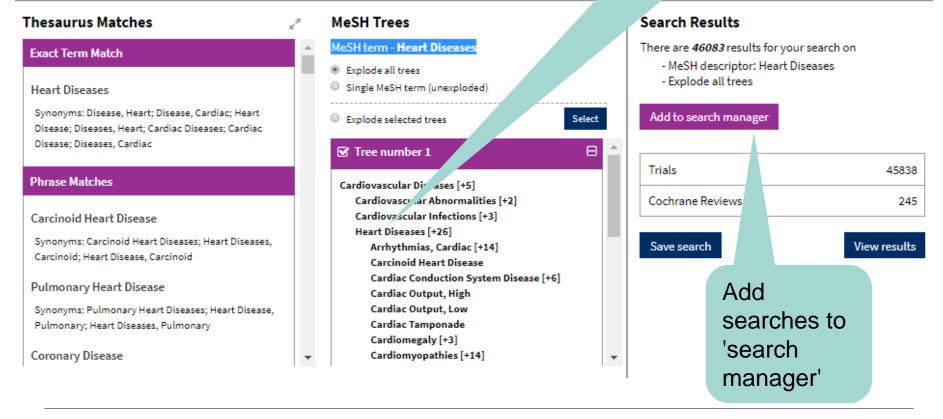
## Cochrane Library - Advanced Search: 'MeSH'

#### Definition of the MeSH term

Tree structure: 'explode' includes everything below the term

#### Definition

Heart Diseases - Pathological conditions involving the HEART including its structural and functional abnormalities.



## **Exercise 3: MeSH terms**



In overweight or obese children, are parent-only or child-only interventions more effective to stabilize the weight?

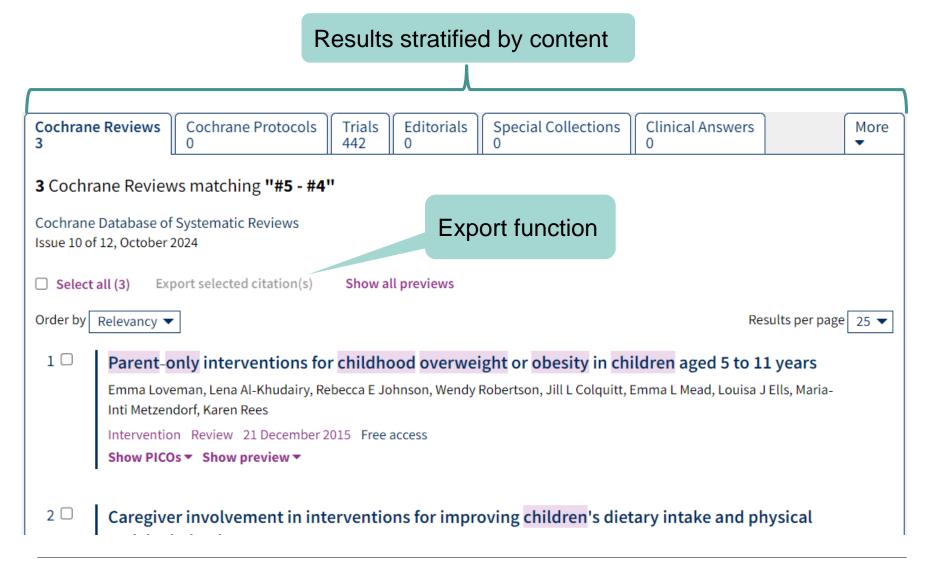
#### Task:

Find MeSH terms matching the PICO aspects (via Medical terms or search manager) and search for them (add to search manager).



https://youtu.be/57jEMZ87ND8

## **Cochrane Library - Display of search results**



## **Cochrane Library - Cochrane review single view**

Cochrane Database of Systematic Reviews

#### Antiplatelet agents and anticoagulants for hypertension

Cochrane Systematic Review - Intervention | Version published: 07 December 2011 | see what's new

View article information



New search

## **Summary in different languages**

Abstract available in English | Français | 日本語

#### Background

Elevated systemic blood pressure res (CHD), ischaemic strokes and periph complications related to elevated bl thromboembolism. Therefore it is in related complications in patients wi

#### Objectives

To conduct a systematic review of th including those with elevations in bo blood pressure, to address the following

#### Cochrane Review with current and revised version

- Information on the review (MeSH keywords, editorial group, etc.)
- History of the review

when compared to placebo or other active treatment; and (ii) oral anticoagulants reduce total deaths and/or major thromboembolic events when compared to placebo or other active treatment.

#### Search methods

Electronic databases (MEDLINE, EMBASE, DARE, CENTRAL, Hypertension Group specialised register) were searched up to January



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c events

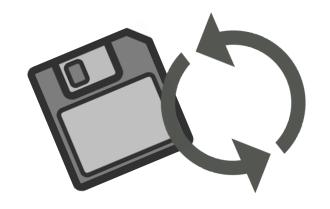
Characteristics of studies Data and analyses

Share

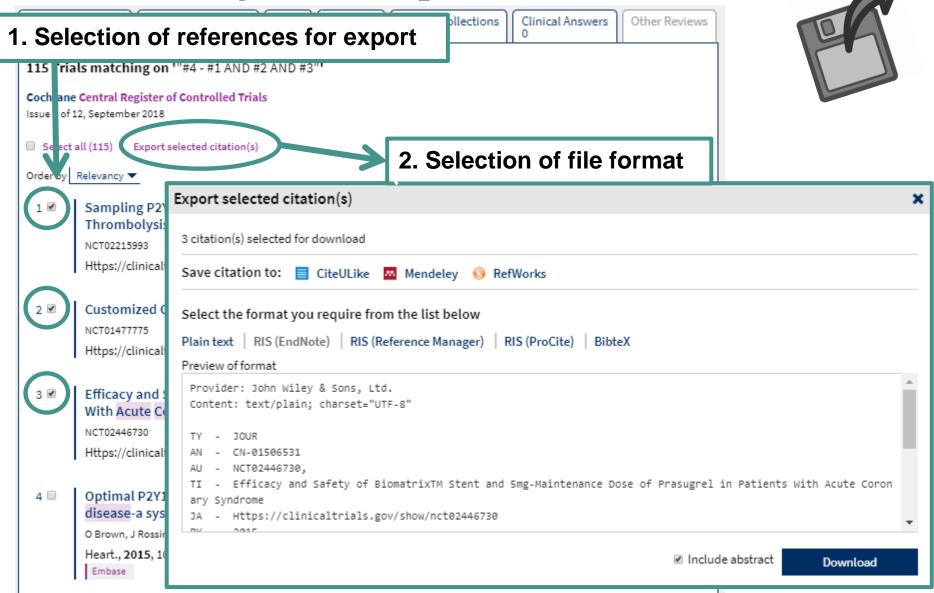
Email

## Search management - Save searches and receive updates

- Log in to Cochrane to save searches in the Advanced Search environment
- Select saved searches with "View searches", then
  - Share searches
  - Export for print
  - Activate "e-mail alert" to be informed when new articles matching my search are added to the Cochrane Library
- Topic Alerts



## Search management - Export of references



## **Exercise 4: Combinations**



In overweight or obese children, are parent-only or child-only interventions more effective to stabilize the weight?

#### Task:

Now combine the MeSH search with the text word search. Use the Search Manager for this. Individual lines can be combined with # and the line number.



https://youtu.be/57jEMZ87ND8



# Thank you for your attention

#### **Further education:**

https://ub.unibas.ch/de/ub-medizin/#c10080

**Contact:** Hannah.Ewald@unibas.ch

**Feedback:** <a href="https://evasys.unibas.ch/evasys/online.php?p=2CZZT">https://evasys.unibas.ch/evasys/online.php?p=2CZZT</a>



## **Appendix: Scoping Reviews**

- Usually answer broader questions than classic systematic reviews
- Risk of bias assessment not always necessary

#### Reasons for a Scoping Review:

- To pave the way for a Systematic Review
- To identify and analyse gaps in knowledge
- To explore what types of evidence are available in a particular area
- To clarify key concepts/definitions in the literature
- To examine how research is conducted on a particular topic or field
- To identify key features or factors in the context of to a concept

#### **Further Guidance:**

 Joanna Briggs Institute Manual for Evidence Synthesis: https://jbi.global/scoping-review-network/resources

**Source**: Munn et al. (2018) 'Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach', BMC Med Res Methodol, vol. 18, no. 1, pp. 143. DOI: 10.1186/s12874-018-0611-x

## **Appendix: Narrative Review and other review types**

A narrative review describes and evaluates studies, BUT usually does not describe specific methods by which they were identified, selected and evaluated.

#### **Reasons for a Narrative Review:**

- As part of a background or discussion section
- As a rationale for further research

#### Limitations:

- Underlying assumptions and objectives often unknown
- High risk of bias in selection and evaluation of literature
- Cannot be replicated

## Other review types:

- Temple University Lib Guide: <a href="https://guides.temple.edu/c.php?g=78618&p=4156607">https://guides.temple.edu/c.php?g=78618&p=4156607</a>
- Sutton et al. (2019) 'Meeting the review family: exploring review types and associated information retrieval requirements'. doi: 10.1111/hir.12276

## Appendix: Narrative Review vs. Systematic Review

Characteristics	Narrative Review	Systematic Review
Research question	Not explicitly / broad	Focused
Search strategy	Usually not available	Systematic, reproducible, sensitive
Selection criteria	Usually not available	Clearly defined
Critical appraisal	Rarely / No	Yes
Synthesis of the study results	Rarely / No	Usually quantitative (meta-analysis)