GEN-8001: Take control of your PhD journey
Literature search for the health sciences

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Schedule

13:15   Intro: Learning outcomes + Why be systematic?
       OR and AND
       Explaining controlled search vocabularies
       Boxing in your search: Translating your research question into searchable concepts

14:00   Activity 1: Practice boxing

14:15   BREAK

14:30   Briefly on finding keywords and building a search

14:45   Activity 2: Practice searching

15:50   Wrap-up + evaluation
Intended learning outcomes

• Explain the purpose of literature search for the research process.
• Select and use scientific databases for advanced literature searches.
• Build advanced searches, using subject headings, operators (AND, OR, adj/near) and search history.
Why be systematic about it?

CURRENT CONTROVERSY
The hexamethonium asthma study and the death of a normal volunteer in research

“The OHRP found that prior to approving the study, Hopkins researcher Dr Alkis Togias and the Institutional Review Board failed to uncover published literature about the toxic effects of inhaling hexamethonium. According to the OHRP, this information was “readily available via routine MEDLINE and Internet database searches, as well as recent textbooks on pathology of the lung”. Togias had performed a standard PubMed search and consulted standard, current edition, textbooks ”.

(Savulescu & Spriggs, 2002, p. 3).
Why be systematic about it?

Avoidable waste in the production and reporting of research evidence

Iain Chalmers, Paul Glasziou

“New research should not be done unless, at the time it is initiated, the questions it proposes to address cannot be answered satisfactorily with existing evidence. Many researchers do not do this—for example, Cooper and colleagues\textsuperscript{13} found that only 11 of 24 responding authors of trial reports that had been added to existing systematic reviews were even aware of the relevant reviews when they designed their new studies.”.

(Chalmers & Glasziou, 2009, p. 87).
Why be systematic about it?

A Comparison of Results of Meta-analyses of Randomized Control Trials and Recommendations of Clinical Experts

“We used the technique of cumulative meta-analysis (performing a new meta-analysis when the results of a new clinical trial are published) and compared the results with the recommendations of the experts for various treatments for myocardial infarction. Discrepancies were detected between the meta-analytic patterns of effectiveness in the randomized trials and the recommendations of reviewers. Review articles often failed to mention important advances or exhibited delays in recommending effective preventive measures. In some cases, treatments that have no effect on mortality or are potentially harmful continued to be recommended by several clinical experts.”

Why use controlled search vocabularies?

**Synonymous expressions**

Suppose we want studies on child maltreatment.
Why use controlled search vocabularies?

**Synonymous expressions**

Suppose we want studies on **child maltreatment**

- Child mistreatment
- Neglected children
- Child maltreatment
- Child neglect
- Abused adolescents
- Child sexual abuse
- Child abuse
- Childhood emotional maltreatment
- Childhood abuse
- Mistreatment of children

exp Child Abuse/
Why use controlled search vocabularies?

Peripheral mentions

Many sources will mention child abuse, but only peripherally. Indexers will then not apply the heading (we hope).
Use it to:
• Combine keywords (controlled and textwords) that belong to the same overall concept (i.e., keywords that are synonyms or almost synonyms, or instances of the concept).

Effects of combining with OR:
• Expands your search
• More OR-combinations means more records in your results list
All records in database

AND

social anxiety/
OR
social phobia/

drug therapy/

Use it to:
• Combine keywords (or sets of keywords) from different concepts, in order to capture records that are about both (or all).

Effects of combining with AND:
• Limits your search
• More AND-combinations means fewer records in your results list

Hint: Corresponds to intersection in basic set theory.
Interpret/translate scientific hypothesis/objectives into search phrases

1. Periodontal diseases have been shown to carry an increased risk for preterm birth; the rationale for this assumption is based upon the fact that periodontitis may lead to maternal and fetal inflammation, thus triggering the common pathway of preterm parturition syndrome including increased uterine contractility, cervical ripening and decidua/membrane activation.

2. In humans, accidental hypothermia (AH) is defined as an unintended lowering of the body temperature to below 35 °C due to exposure to cold environments or a decrease in metabolic rate. The condition has been characterized by different stages of severity based on the prevailing core temperature, as mild AH (32-35 °C), moderate AH (28-32 °C), severe AH (<28 °C), and deep AH (<20 °C).
Dental caries and preterm birth

- Think in «boxes»:
exp Dental Caries/ OR
caries.ti,ab,kw.
OR
dental caries.ti,ab,kw.
OR
tooth decay.ti,ab,kw.
OR
decayed tooth.ti,ab,kw.
OR
decayed teeth.ti,ab,kw.
OR
(cavity adj3 tooth).ti,ab.
OR
(cavities adj3 teeth).ti,ab.
OR
exp DMF Index/ OR
DMFT.ti,ab,kw.
OR
DMF.ti,ab,kw.
OR
exp Streptococcus mutans/ OR
streptococcus mutans.ti,ab,kw.
OR
exp Streptococcus sobrinus/ OR
streptococcus sobrinus.ti,ab,kw.
OR
exp Lactobacillus acidophilus/ OR
Lactobacillus acidophilus.ti,ab,kw.

exp Premature Birth/ OR
preterm birth.ti,ab,kw.
OR
exp Fetal Growth Retardation/ OR
fetal growth restriction.ti,ab,kw.
OR
exp Stillbirth/ OR
stillbirth.ti,ab,kw.
OR
exp Perinatal Death/ OR
neonatal death.ti,ab,kw.
OR
exp Abruptio Placentae/ OR
placental abruption.ti,ab,kw.
OR
exp Infant, Low Birth Weight/ OR
low birth weight.ti,ab,kw.
OR
exp Infant, Small for Gestational Age/ OR
small for gestational age.ti,ab,kw.
OR
exp Fetal Membranes, Premature Rupture/ OR
preterm premature rupture of membranes.ti,ab,kw.
OR
exp Venous Thrombosis/ OR
depth vein thrombosis.ti,ab,kw.
OR
exp Thromboembolism/ OR
thromboembolism.ti,ab,kw.
OR
exp Pulmonary Embolism/ OR
pulmonary embolism.ti,ab,kw.
OR
exp Cesarean Section/ OR
cesarean section.ti,ab,kw.
OR
exp Endocarditis/ OR
endocarditis.ti,ab,kw.
OR
exp Fetal Membranes, Premature Rupture/ OR
preterm premature rupture of membranes.ti,ab,kw.
OR
PPROM.ti,ab,kw.
OR
prelabor rupture of membranes.ti,ab,kw.
OR
PROM.ti,ab,kw.
OR
short cervix.ti,ab,kw.
OR
low apgar score.ti,ab,kw.
OR
chorioamnionitis.ti,ab,kw.

exp Diabetes, Gestational/ OR
gestational diabetes.ti,ab,kw.
OR
exp Postpartum Hemorrhage/ OR
postpartum hemorrhage.ti,ab,kw.
OR
exp Cesarean Section/ OR
cesarean section.ti,ab,kw.
OR
exp Hypertension, Pregnancy-Induced/ OR
gestational hypertension.ti,ab,kw.
OR
exp Pre-Eclampsia/ OR
preeclampsia.ti,ab,kw.
OR
exp Abruptio Placentae/ OR
placental abruption.ti,ab,kw.
OR
exp Infant, Low Birth Weight/ OR
low birth weight.ti,ab,kw.
OR
exp Puerperal Infection/ OR
puerperal sepsis.ti,ab,kw.
OR
exp Breast Feeding/ OR
breast feeding.ti,ab,kw.
OR
antepartum hemorrhage.ti,ab,kw.
OR
deep vein thrombosis.ti,ab,kw.
OR
depth vein thrombosis.ti,ab,kw.
OR
exp Thromboembolism/ OR
thromboembolism.ti,ab,kw.
OR
exp Pulmonary Embolism/ OR
pulmonary embolism.ti,ab,kw.
OR
exp Cesarean Section/ OR
cesarean section.ti,ab,kw.
OR
exp Endocarditis/ OR
endocarditis.ti,ab,kw.
OR
exp Fetal Membranes, Premature Rupture/ OR
preterm premature rupture of membranes.ti,ab,kw.
OR
PPROM.ti,ab,kw.
OR
prelabor rupture of membranes.ti,ab,kw.
OR
PROM.ti,ab,kw.
OR
short cervix.ti,ab,kw.
OR
low apgar score.ti,ab,kw.
OR
chorioamnionitis.ti,ab,kw.
1. Periodontal diseases have been shown to carry an increased risk for preterm birth; the rationale for this assumption is based upon the fact that periodontitis may lead to maternal and fetal inflammation, thus triggering the common pathway of preterm parturition syndrome including increased uterine contractility, cervical ripening and decidua/membrane activation.

2. In humans, accidental hypothermia (AH) is defined as an unintended lowering of the body temperature to below 35 °C due to exposure to cold environments or a decrease in metabolic rate. The condition has been characterized by different stages of severity based on the prevailing core temperature, as mild AH (32-35 °C), moderate AH (28-32 °C), severe AH (<28 °C), and deep AH (<20 °C).
Treatment of accidental hypothermia

• Think in «boxes»:

Hypothermia AND Intervention
Treatment of accidental hypothermia – a systematic review

AND

Hypothermia (MeSH)
OR
Accidental hypothermia (non-Mesh)
OR
Frostbite (MeSH)
OR
Cold Temperature (MeSH)
OR
Cold exposure (MeSH)
OR
Body Temperature (MeSH)
OR
Core temperature (non-MeSH)

OR
Extracorporeal Membrane Oxygenation (MeSH)
OR
ECMO (non-MeSH)
OR
Rewarming (MeSH)
OR
Surface rewarming (non-MeSH)
OR
Spontaneous rewarming (non-MeSH)
OR
Patient rewarming (non-MeSH)
OR
Heart-lung machine (MeSH)
OR
Cardiopulmonary Resuscitation (MeSH)
Treatment of accidental hypothermia

• Think in «boxes»:

Hypothermia AND Intervention AND Cause
Hypothermia (MeSH) OR Accidental hypothermia (non-Mesh) OR Cold Temperature (MeSH) OR Cold exposure (MeSH) OR Body Temperature (MeSH) OR Core temperature (non-MeSH) AND Extracorporeal Membrane Oxygenation (MeSH) OR Extracorporeal circulation OR ECMO (non-MeSH) OR Rewarming (MeSH) OR Surface rewarming (non-MeSH) OR Spontaneous rewarming (non-MeSH) OR Patient rewarming (non-MeSH) OR Heart-lung machine (MeSH) OR Cardiopulmonary Resuscitation (MeSH) OR CPR OR Cardiac arrest OR Invasive rewarming OR CPB OR Cardiopulmonary bypass OR Hypothermic cardiac arrest OR Renal replacement therapy OR Renal replacement machines OR Dialysis machines AND Accidents (MeSH) OR Avalanches (MeSH) OR Disasters (MeSH) OR Mass Casualty Incidents (MeSH) OR Emergencies (MeSH) OR Accidents, Aviation (MeSH) OR Warfare (MeSH) OR major accidents (non-MeSH) OR major incident (non-MeSH) OR Drowning OR Near-drowning
Activity 1: Practice «boxing»
(ca. 15 mins)

Work in pairs (or trios):
• Explain your research question (or topic), as clearly and concisely as you can, to your partner.
• Work together to identify the main concepts («boxes») on which you could build a search.
• At half time (or third), switch and repeat.
"Developing a search strategy is an iterative process in which the terms that are used are modified, based on what has already been retrieved."

"There are diminishing returns for search efforts; after a certain stage, each additional unit of time invested in searching returns fewer references that are relevant to the review."

(Higgins & Green, 2011, Section 6.4.4, our emphasis).
Database selection

Talk to the library!

**Med/health essentials:**
- Cochrane library (Wiley)
- Medline (Ovid)
- Embase (Ovid)
- PsycINFO (Ovid)
- CINAHL (EBSCO)

**Cross disciplinary:**
- Google Scholar
- Scopus (Elsevier)
- Web of Science (Clarivate)

And many more...
How to find the keywords?

1. Use sources you already have, or that you find in intuitive searches.
   a. They must be the kind of sources you want to capture.
   b. Look them up in the database of your choice and make a note of how they are indexed.
2. Use the database interface to find subject headings and entry terms.
3. Mine the brains of experts.
Search demo

Working title: «What is the effect of CBT for insomnia on pain?»

Main concepts? CBT, insomnia, pain

Databases? PsycINFO, Medline, Embase

Database: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) <1946 to Present>
Search Strategy:

1 Cognitive Therapy/ (21332)
2 cognitive behavio?r therapy.mp. (12481)
3 CBT.mp. (8127)
4 or/1-3 (27554)
5 sleep deprivation/ or "sleep initiation and maintenance disorders"/ (19484)
6 insomnia*.mp. (16093)
7 (sleep adj (curtailment or disruption or quality)).mp. (11163)
8 or/5-7 (37309)
9 exp pain/ (354182)
10 4 and 8 and 9 (54)
Activity 2: Practice searching
(ca. 90 mins)

Work individually (or in pairs, if you prefer):
• Build a search in the top ranked database for your topic, using controlled terms (if available), text words (if necessary), operators as necessary, and the search history.
• If time: Adapt the search to another database
• Ask us anything!
References


Savulescu, J., & Spriggs, M. (2002). The hexamethonium asthma study and the death of a normal volunteer in research. *Journal of Medical Ethics, 28*(1), 3-4. doi:10.1136/jme.28.1.3
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Today's date: October 10th, 2018