The Systematic Search

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Systematic Searching
(for Systematic Reviews)

- Where to begin
- How to create a strategy
- Which resources
- How to be comprehensive
- How to be extensive
- Checklist
- Documenting the search

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Systematic Searching vs Systematic Review

What this talk is not about:

- Deciding on the question
- Determination of the quality of studies
- Analysis of the selected studies
- Reporting of the results
- Publishing or dissemination of the results

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What's the question?

- What is well established about your research?

- What is new and breakthrough about your research?

- What's the question you want to answer?

- The researcher must have the question clearly defined so that the researcher can explain this to the searcher.
  http://www.kce.fgov.be/index_en.aspx?SGREF=5212

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Search Acronyms

- PICO(S)
    - **P**atient, **I**ntervention, **C**omparison, **O**utcome, (**S**tudy)
    - In a patients undergoing hip replacement, to what extent is the risk of post-op infection reduced by antimcrobial prophylaxis
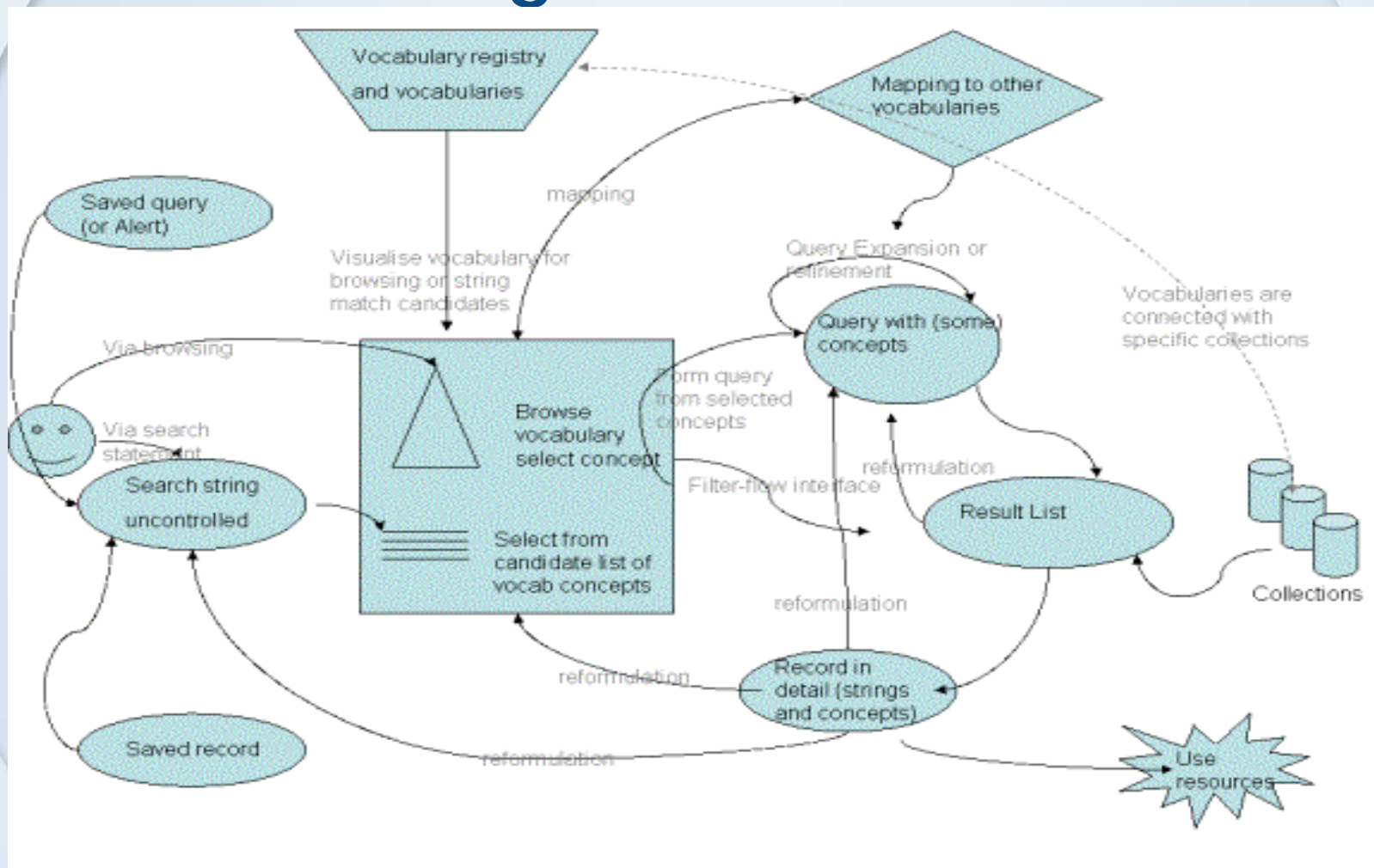
- SPICE
    - **S**etting, **P**erspective, **I**ntervention, **C**omparison, **E**valuation
    - What is the impact of an increase in the level of cost-sharing on access to health services for the chronically ill in Canada

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Moving from
Question to Search Strategy

- The searcher needs to translate the question into a systematic search method

- There is always a negotiation between the researcher and the searcher.

- Determine which information resources would best respond to the information you are seeking

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Searching for the Evidence
How the Beginner sees the search

The Systematic Searcher's Viewpoint

Define Question

Select information Resources

Formulate query

Perform Search

No

Evaluate results Satisfactory?

Yes

Record strategy & Capture Results

Fishing in the Right place

Start Here...

Reference Books: Overview or historical context of topic;
Considered **tertiary** sources

Books: In-depth information about a topic; may be **primary**
or **secondary** sources; published 2-5 years after
completion of research

Journal Articles: Results of current research;
considered **primary** sources; may appear
as early as 6 months after research is
completed

Conference Proceedings:
Dissemination of ideas
and initial findings
among scholars,
researchers or
practitioners

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Levels of Evidence
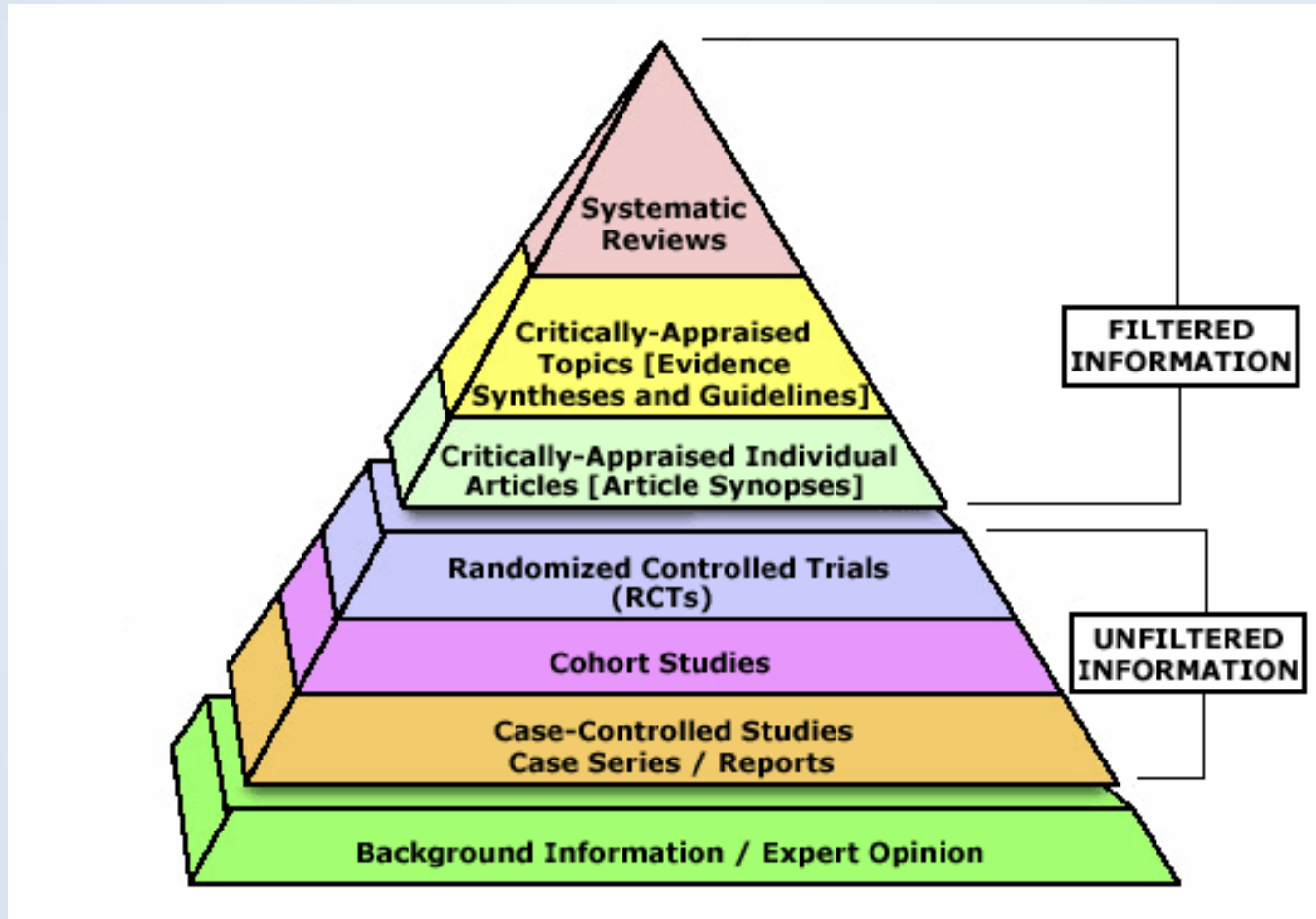
Mainstream Literature

Non-English Literature

Unpublished reports

Grey Literature
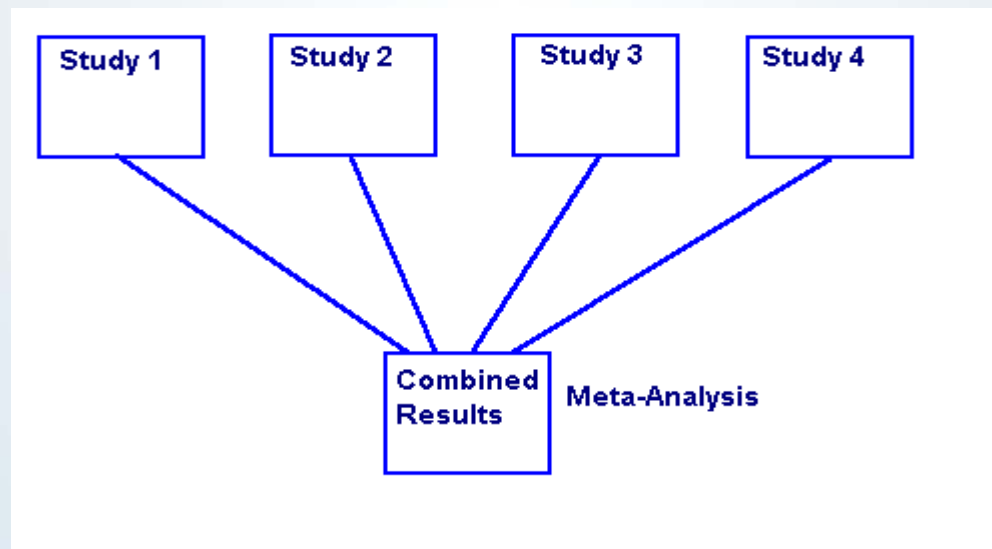
Major sources for identifying research

1. Electronic databases

2. Print indexes

3. Hand searching

4. Checking reference lists

5. Identifying unpublished studies

6. Personal communication

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Understanding Research Tools
Online Catalogues Versus Databases

- Online library catalogs can be used to identify journals (but not the articles), books (but not the chapters), and dissertations. Library catalogues usually only tell you only whether a particular library owns the item, where in the library it is located, and whether it is available for loan.

- Scholarly "bibliographic" databases are the best tools for identifying journal articles.

- Some scholarly databases can also be used to identify: Chapters in books , Books, Conference papers or Dissertations

- Remember that identifying and obtaining materials are often two different processes, and not everything found in the databases will be a "full text" document. In fact, don't be surprised if you see only abstracts for the most part.

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Bibliographic Databases

- Ovid
  - EBMR
  - EMBASE
  - HealthStar
  - Medline
- EBSCO
  - CINAHL
  - Biomedical Reference Collection
  - Medline
  - PsycINFO

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PubMed/ Medline

- By US National Library of Medicine
- Type of Database: Bibliographic
- Over 17,000,000 citations of both clinical and preclinical studies.
- complementary database known as PreMEDLINE includes citations and abstracts for studies that have been published recently but not yet indexed.
- Subject Coverage: All Specialties of Medicine
- 60% of References contain Abstracts

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EMBASE

- Elsevier Science Publishers, Netherlands
- Type of Database: Bibliographic
- Numbers of Journals: 3500
- Bias: European in focus
- Thesaurus: Uses own thesaurus
- Subject Coverage: Strong on Pharmaceutical and Clinical Medicine, Complementary/Alt Medicine
- Materials Indexed: Letters, Editorials, Research Articles from 1974 or 1981 onwards (depending on method of access)
- Overlap with MEDLINE estimated at between 25 and 40%
- 75% of References contain Abstracts

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The Cochrane Library

- The Cochrane Library contains high-quality, independent evidence to inform healthcare decision-making. It includes reliable evidence from Cochrane and other systematic reviews, clinical trials, and more. Cochrane reviews bring you the combined results of the world's best medical research studies, and are recognised as the gold standard in evidence-based health care.

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www.TheCochraneLibrary.com

# Cochrane Central Register of Controlled Trials

- Contained just almost 500,000 citations (Jan 2007) Includes citations to reports of controlled trials that might not be indexed in MEDLINE, EMBASE or other bibliographic databases
  - published in many languages
  - citations that are available only in conference proceedings or other sources that are difficult to access

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Some databases are specialised

Focus on specific areas of health

- ✓ Cumulative Index of Nursing and Allied Health (CINAHL)
- ✓ PsycINFO
- ✓ Popline (Reproductive Medicine)
- ✓ British Nursing Index (BNI)
- ✓ Biological Abstracts
- ✓ Pascal (French, Eng, Spanish)
- ✓ Ageline

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Creating a search strategy
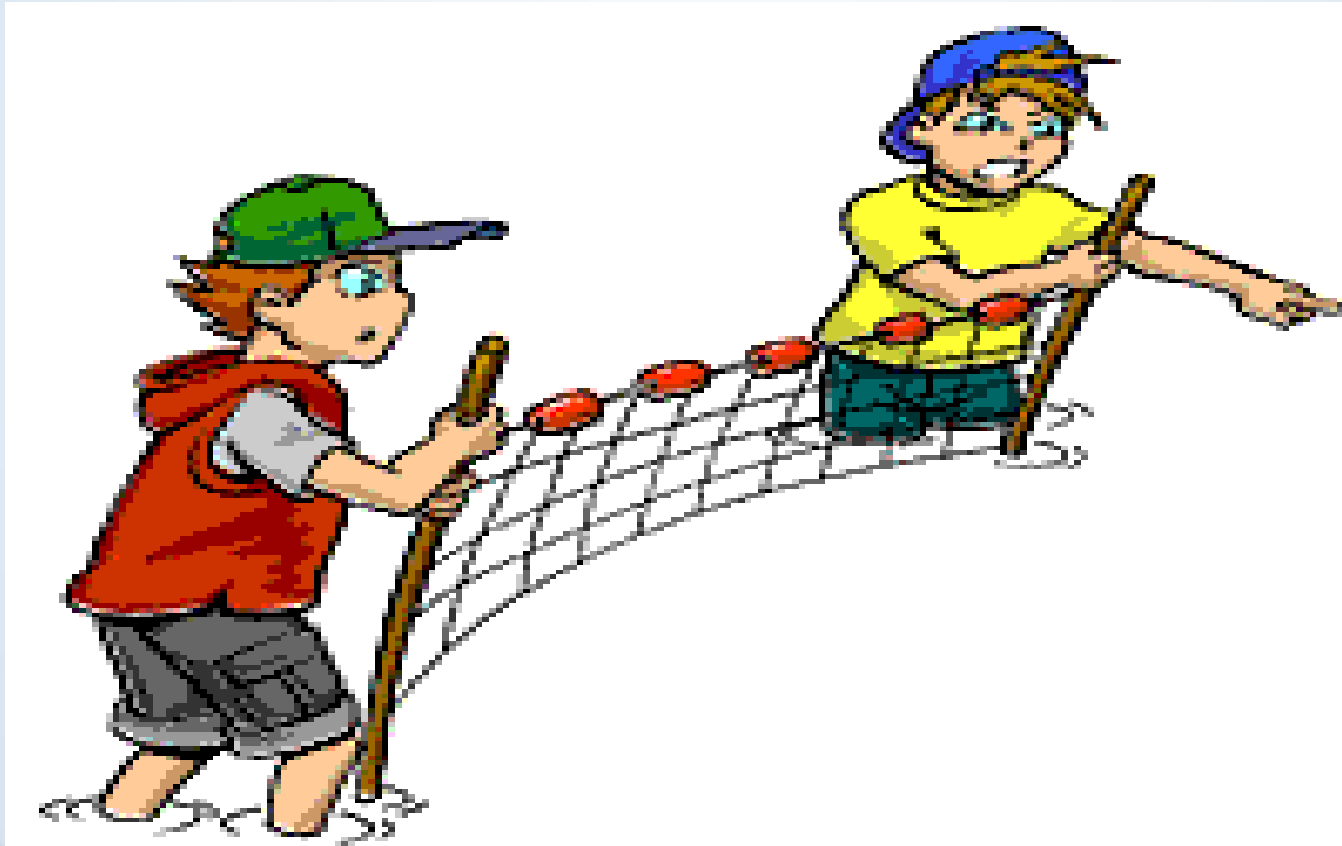
Search Strategy

- Before launching into complex searching, do a few test runs or a little fishing trip.

- This will help you to identify databases and also key terms.

- Determine need for type of fishing trip you want to embark upon.

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Where to search?

- Studies have shown that only 30 - 80% of all known published RCTs were identifiable using MEDLINE (depending on the area or specific question)…Dickersin 1994

- According to ULRICHs Database of Periodicals, there are over 20,000 active health / medical journals.

- So MEDLINE, is generally not considered adequate for a systematic review.

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Developing a search strategy

- Ensure that database-specific search term syntax will be appropriate.

- Use advanced searching techniques where available (i.e. explode, focus, limiters)

- Be aware of greater importance of high recall (sensitivity) as compared to precision (specificity) in searching for studies for systematic reviews

- Think about how you might access non-subscribed databases

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Search should be :

- Be sensitive
  - look in a number of different places - not a single database
- Minimize bias
  - Think about finding studies that aren't in the major sources like PubMed/MEDLINE.
- Be efficient
  - start looking in the place you expect to have the highest yield.

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Fishing Tips
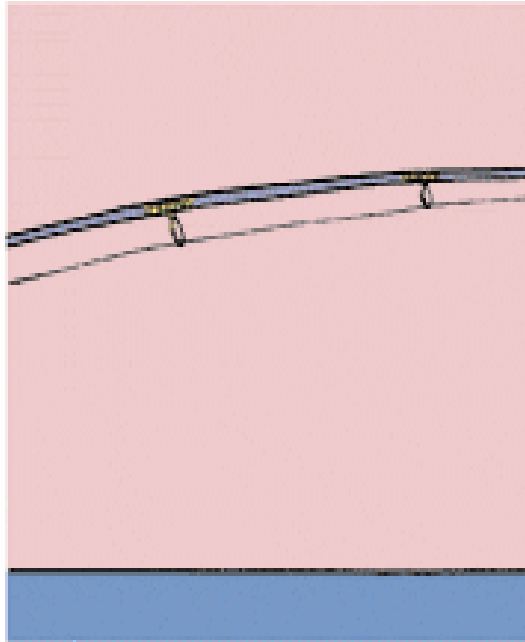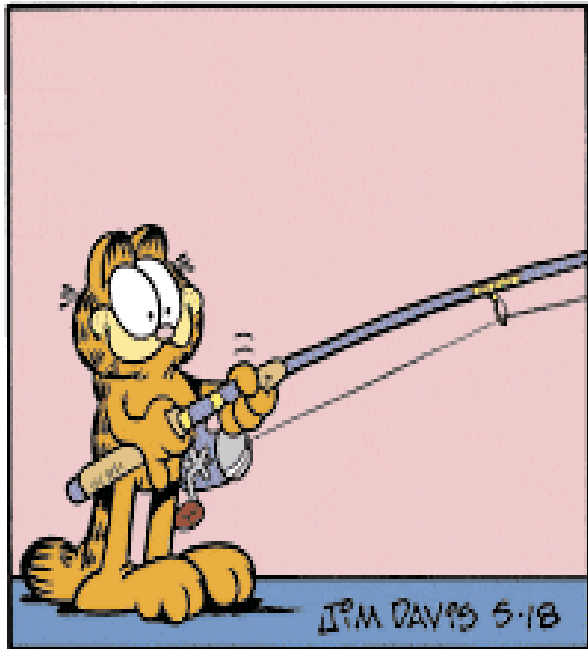
Finding all the terms to describe your search

Specific **food intake,** **fat** and fiber intake, and behavioral correlates of **BMI** among **overweight** and **obese** members of a managed care organization.

Linde JA, **Utter J**, **Jeffery RW**, **Sherwood NE**, **Pronk NP**, **Boyle RG**.

Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, Minneapolis, MN, USA. linde@epi.umn.edu.

ABSTRACT: BACKGROUND: The study examined correlates of **body mass index** (BMI) in **overweight** and **obese** members of a managed care organization seeking treatment for **obesity**. It assessed intake of specific foods, dietary fat or fiber, and behaviors attempted to **control weight**. METHODS: Participants were 508 men and 1293 women who were > 18 years and had a self-reported BMI > 27.0. This paper reports analyses of baseline and 24-month follow-up data from a randomized **weight-loss trial**. Cross-sectional and prospective relationships between BMI and behaviors were examined with regression analyses controlling for age and education. RESULTS: At baseline, hamburger and **beef consumption** were associated with **higher BMI** for men; for women, hamburger, fried chicken, hot dog, bacon or sausage, egg, French fry, and overall fat consumption were associated with higher BMI, while eating high fiber cereal, fruit, and overall fiber intake were associated with lower BMI. Virtually all forms of **weight control behavior** were reported more often in **heavier people.** Subscribing to exercise magazines, however, was associated with lower **BMI**. Decreased fat intake and increased fruit/vegetable/fiber intake over the course of the study were associated with reductions in BMI at 24 months. CONCLUSION: The same behaviors that differentiate individuals with different body weight in the general population also differentiate between individuals of different **body weights** at the high end of the **weight distribution.** Educational efforts aimed at preventing **weight gain** and reducing **obesity** might benefit from focusing on specific foods known to be associated empirically with body weight and **weight change** over time.

Finding Pregnancy related terms

Pregnancy-associated deaths and pregnancy-related deaths in Wisconsin, 1998-2001.

Mascola MA, Schellpfeffer MA, Kruse TK, Conway AE, Kvale KM, Katcher ML.

Bureau of Community Health Promotion, Division of Public Health, Department of Health and Family Service, Madison, WI 53701-2659, USA.

BACKGROUND: Although the risk of dying during childbirth or from complications afterward has been greatly reduced during the past 100 years, the current rate of approximately 1 death in 10,000 live births is still too high. The goal of the US Department of Health and Human Services is to reduce this rate by more than half by the year 2010. OBJECTIVE: To present Wisconsin data regarding pregnancy-associated deaths and pregnancy-related deaths. METHODS: Cases in which a woman had died during pregnancy or within 1 year of the end of her pregnancy were identified, and case-specific data were collected. The Wisconsin Maternal Mortality Review Team then conducted systematic reviews of the information, summarized issues related to maternal mortality, considered the relationship to pregnancy and factors of avoidability, and made recommendations to improve maternal health and survival. Finally, pregnancy-associated and pregnancy-related mortality ratios were calculated. RESULTS: From 1998 through 2001, 23 Wisconsin women died as a result of their pregnancy or from complications up to a year later. This gives a Wisconsin pregnancy-related mortality ratio of 8.4 per 100,000 live births. This ratio was higher in African American women and in women who smoked. The primary cause of death was embolic disease. Almost half of the pregnancy-related deaths (48%) occurred during the postpartum period and nearly one-quarter (22%) were avoidable. CONCLUSIONS: The disparity in pregnancy-related mortality ratios among ethnic groups and the finding of avoidable deaths are areas that should be targeted by health care providers and public health workers. Six areas on which to focus include the following: addressing racial disparities, assuring the performance of autopsies, lifestyle changes related to obesity and smoking, and management of embolic and cardiovascular disease, as well as postpartum hemorrhage.

No Abstract ?

Display Citation ▼ Show 20 ▼ Sort by ▼ Send to ▼
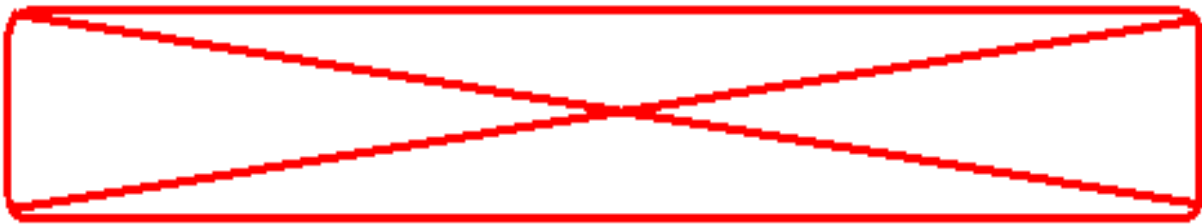
All: 1 Review: 0 ✖

1: Harv Health Lett. 2005 Mar;30(5):4.

Is it okay to be fat if you're fit? Research suggests that physical activity may cancel out some of the bad effects of being overweight or obese.

[No authors listed]

PMID: 16526111 [PubMed - indexed for MEDLINE]

How to maximize your selection

Use Cochrane for Search Methodology

Boolean Search

A [magenta intersection] B   **AND**

A [yellow] B   **OR**

A [green] B   **NOT**

AND – Both concepts must be present

cancer

diet

cancer AND diet

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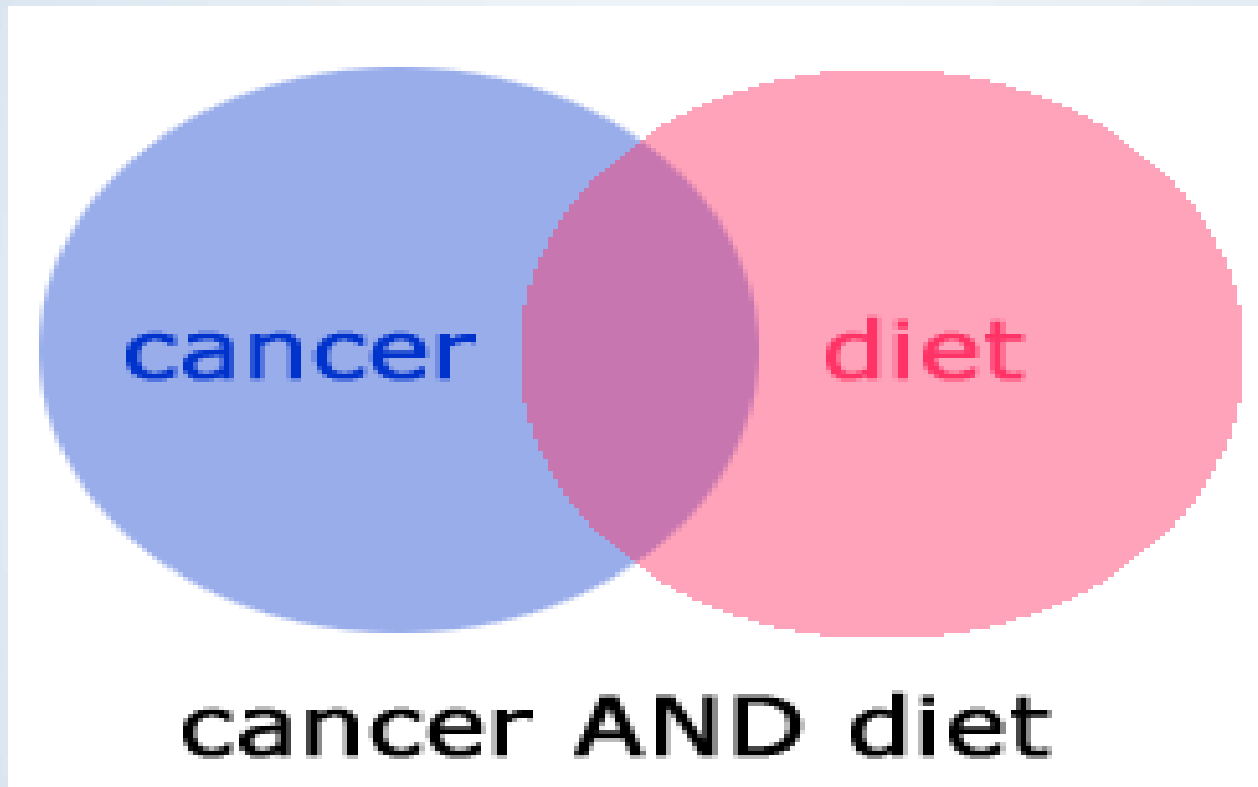
OR – similar concepts are found
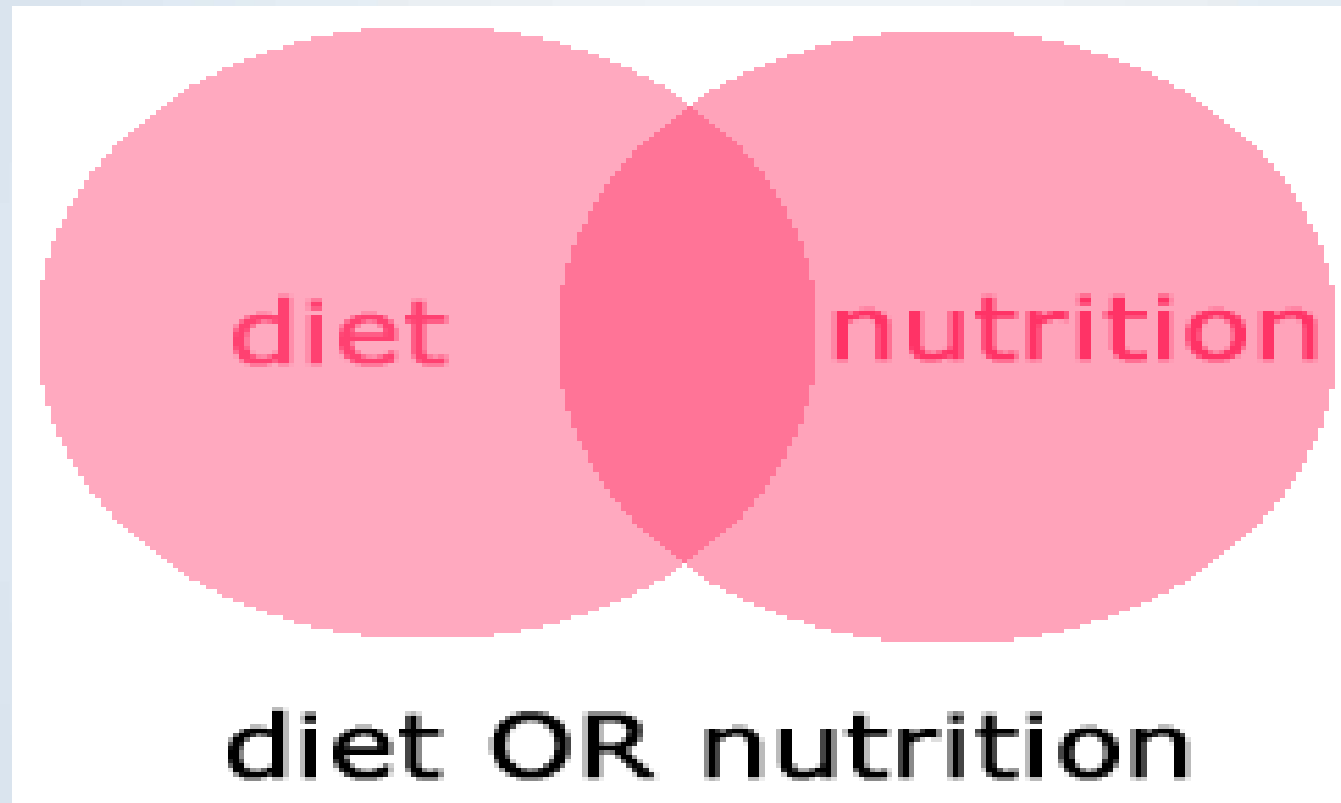
The basic search
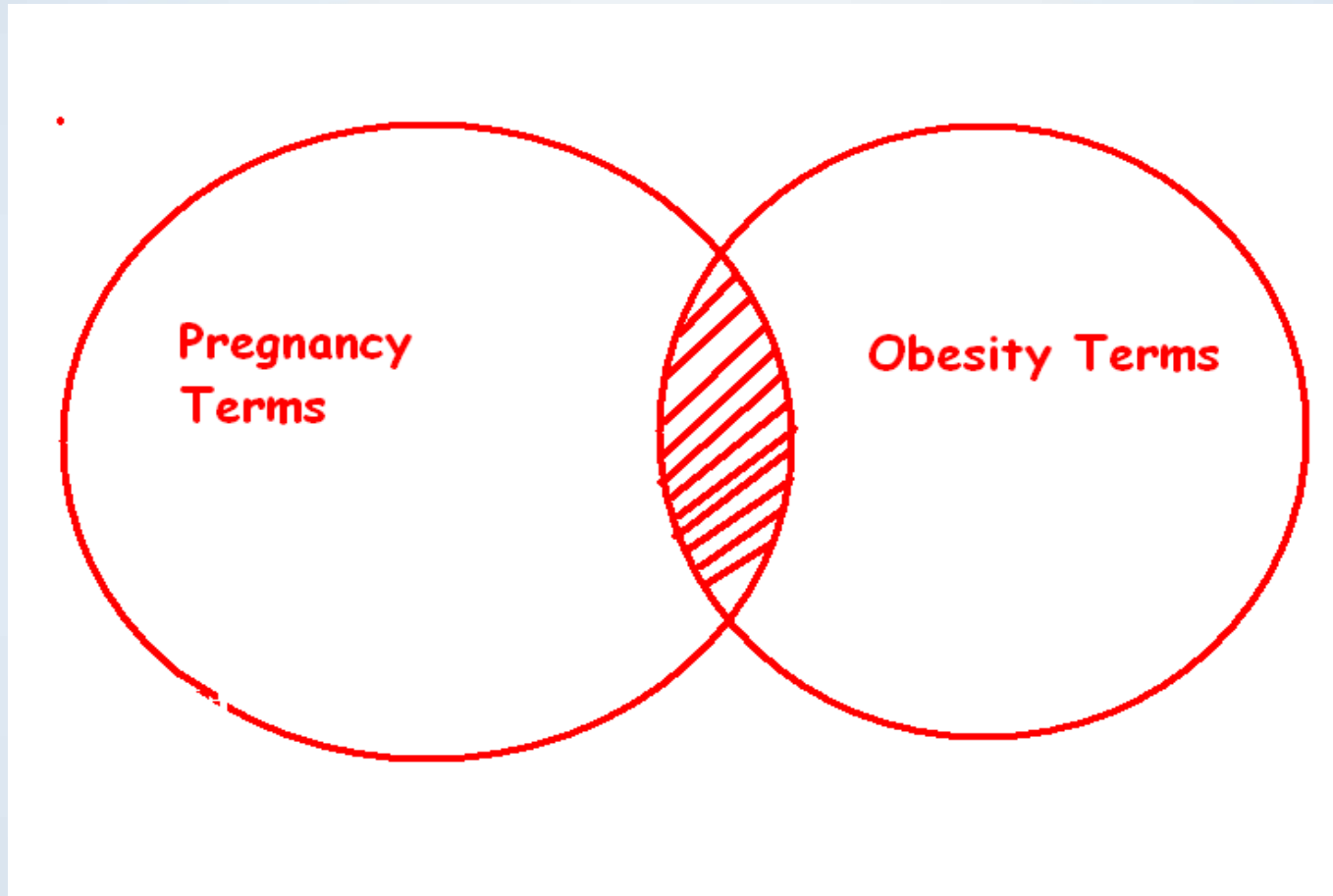
Left circle:
Obesity [MeSH] OR
Overweight [MeSH]
Overweight [All Fields]
Body Mass Index
BMI [All Fields]
Obese [All Fields]
And other terms....

Right circle:
Pregnany [MeSH] OR
Maternal Health Services
[MeSH] OR
Childbirth [All Fields] OR
Postpartum period [MeSH]
Childbirth [All Fields] OR
Pregnan* [All Fields]
and other terms....

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Testing the Search Strategy
Do the results measure up?

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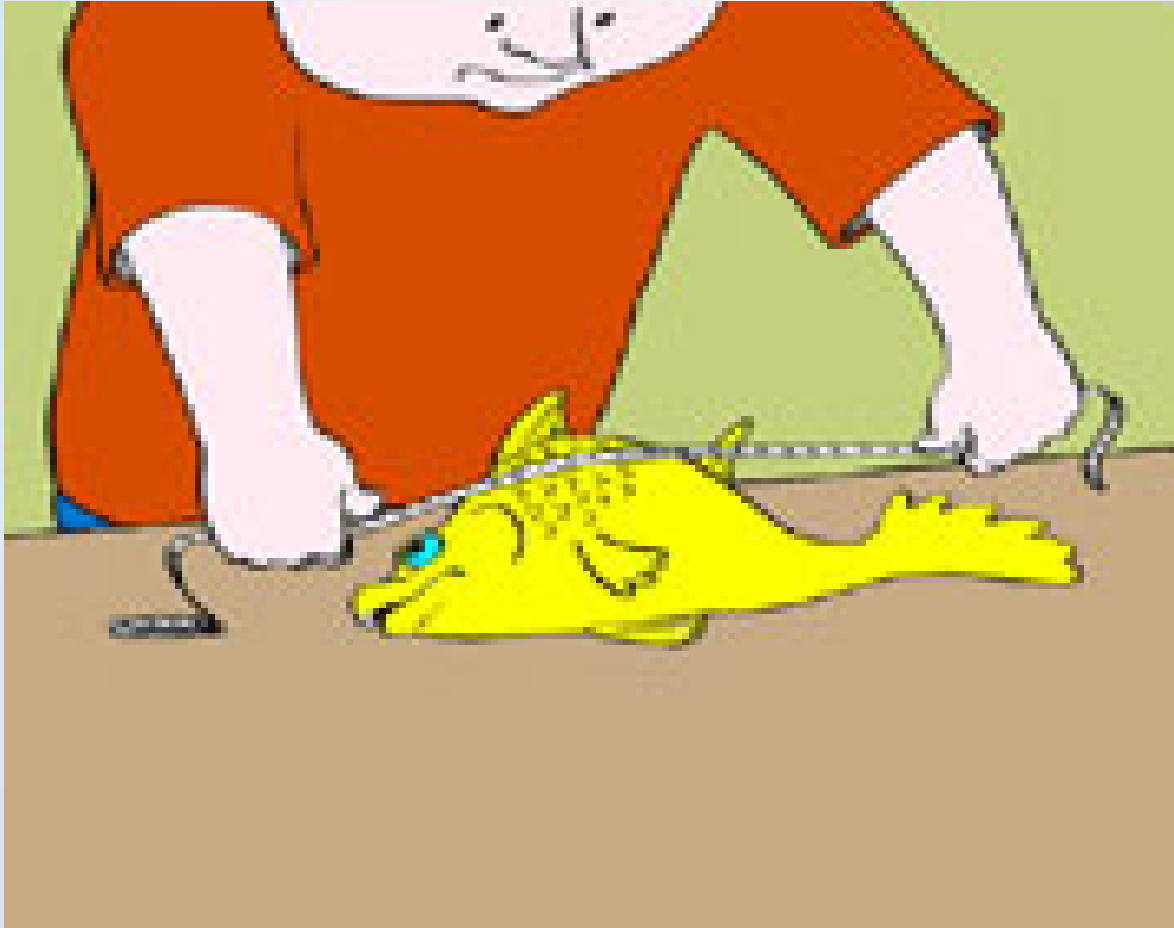
Test your search strategy

- Create your search strategy
- Run in the database such as PubMed
- Check to see if all the previously identified studies / articles that are relevant to your question have been found using your search strategy.
- If any articles/studies not found, examine the studies to see what MeSH, Keywords or other terms could be used.

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New Global Index Medicus
http://www.who.int/ghl
2007

The last few remaining sources: Unpublished, Grey Literature & Handsearching

Handsearching

- **Definition**:

  Handsearching involves a manual page-by-page examination of the entire contents of a journal issue to identify all eligible reports of trials.

Need for handsearching

1. Not all trial reports are included on electronic bibliographic databases

    For example: Conference proceedings are important to handsearch because individual conference. These abstracts are not included on MEDLINE and are not usually included in other databases.

2. Even when they are included, they may not be indexed with terms that allow them to be easily identified as trials

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Checking reference lists

- Following up references from one article to another

- Looking for previous reviews of the topic and checking their reference lists

- Efficient means of identifying studies for possible inclusion in a review

- Reference lists should never be used as a sole approach to identifying reports for a review (because of publication bias)

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Identifying unpublished studies

What Is Grey Literature?

Literature that is not widely published

- Dissertations
- Theses
- Government reports
- Ongoing studies
- etc…

Clinical Trial sites

- TrialsCentral
  - www.trialscentral.org
- Current Controlled Trials
  - www.controlled-trials.com
- clinicaltrials.gov (by NLM)
  - www.clinicaltrials.gov

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clinicaltrials.gov

- By NLM

- Provides regularly updated information about federally and privately supported clinical research in human volunteers.

- *ClinicalTrials.gov* gives you information about a trial's purpose, who may participate, locations, and phone numbers for more details

www.clinicaltrials.gov

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Grey Literature Sources

- Excellent resource compiled by Dean Giustini at UBC
- http://toby.library.ubc.ca/subjects/subjpage2.cfm?id=877

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Keeping track of identified studies

We need:

- Some way of keeping track of the references we've looked at.

- Some way of grouping together all the reports of a single study.

- Also we might like to keep a record of where you found each study ,so that you can report how useful different sources were.

Keeping track of identified studies

- Some researchers use bibliographic management software to do all this

- Commercial Products
  - RefWorks
  - Reference Manager
  - EndNote
  - ProCite

- Others are also available (Open Software) See the site BIBLIOPHILE http://bibliophile.sourceforge.net/projects.php

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Plot our your search strategy

Search Planning Form

Use this form to identify/clarify the key concepts and the scope of your research topic.
For each section, refer to the **guidance notes** on the following page for further explanation.

Name: _____

Date search started: _____   Date search completed: _____

1. Your Research Topic

2. Consider how the following four categories apply to your research topic

Patient/Population and/or Problem	Intervention	Comparison/Control *(if applicable)*	Outcomes (or Effects)
Alternative Words			

Keep track of where you have searched

Guidance notes	LEVEL 1: CORE RESOURCES	Searched	N/A	Unavail-able
The resource checklist is divided into 3 levels: core, recommended and additional. Alongside each resource, tick the appropriate column: searched, not applicable (N/A) or unavailable.	**a) Minimum core resources:**			
	• Cochrane Library	❑	❑	❑
	• Centre for Reviews and Dissemination (CRD) website for latest updates to CRD databases	❑	❑	❑
Level 1 – core resources	• MEDLINE & PREMEDLINE OR PubMed	❑	❑	❑
Effective searches across these sources will help ensure that your literature search covers a significant proportion of published research.	• EMBASE	❑	❑	❑
	• Subject specialist databases appropriate to research topic, (contact your librarian with advice on identifying others) e.g.			
Consider how retrospective the search needs to be, e.g. from the time when a drug was introduced; also consider whether the coverage of your source is sufficiently retrospective and/or up-to-date.	a) Allied & Complementary Medicine (AMED)	❑	❑	❑
	b) Applied Social Sciences Index & Abstracts (ASSIA)*	❑	❑	❑
	c) British Nursing Index (BNI)	❑	❑	❑
	d) CareData	❑	❑	❑
These resources should be searched as a minimum requirement unless they are not appropriate to your research topic. If there are time constraints, section a) minimum core resources should be given priority.	e) Cumulative Index to Nursing & Allied Health Literature (CINAHL)	❑	❑	❑
	f) DH-DATA	❑	❑	❑
	g) King's Fund	❑	❑	❑
How far you proceed beyond Level 1 will depend on:	h) PsycINFO	❑	❑	❑
• *The subject of your research*	i) BIOSIS*	❑	❑	❑
• *The type of studies you need to locate (e.g. RCTs)*	j) Campbell Collaboration's Social, Psychological, Educational & Criminological Trials Register (C2-SPECTR)	❑	❑	❑
• *The time available*	k) ChildData *	❑	❑	❑
• *Availability of sources*	l) Education Resources Information Center (ERIC)	❑	❑	❑
• *How essential it is to ensure your research is not duplicating research elsewhere*	• National Research Register & Research Findings electronic Register (ReFeR)	❑	❑	❑
* Resources marked with a * are not available through the NHS core content collection or freely available on the Internet but may be accessible through a University Library or by payment of a fee.	• metaRegister of Controlled Trials (mRCT)	❑	❑	❑
	• National Library of Medicine ClinicalTrials.gov	❑	❑	❑
	• Guidelines sites e.g. National Institute for Health and Clinical Excellence (NICE)	❑	❑	❑
See next page for continued guidance notes.	• Websites of relevant associations, societies, centres of excellence, royal colleges & government bodies	❑	❑	❑

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Let's go fishing…

- Questions?

- Please provide feedback on this lecture to julie.mason@fraserhealth.ca

- Please say what you found useful, not useful, what was clear or not clear and any other suggestions.

Thanks