

Developing a search strategy

November 19, 2010

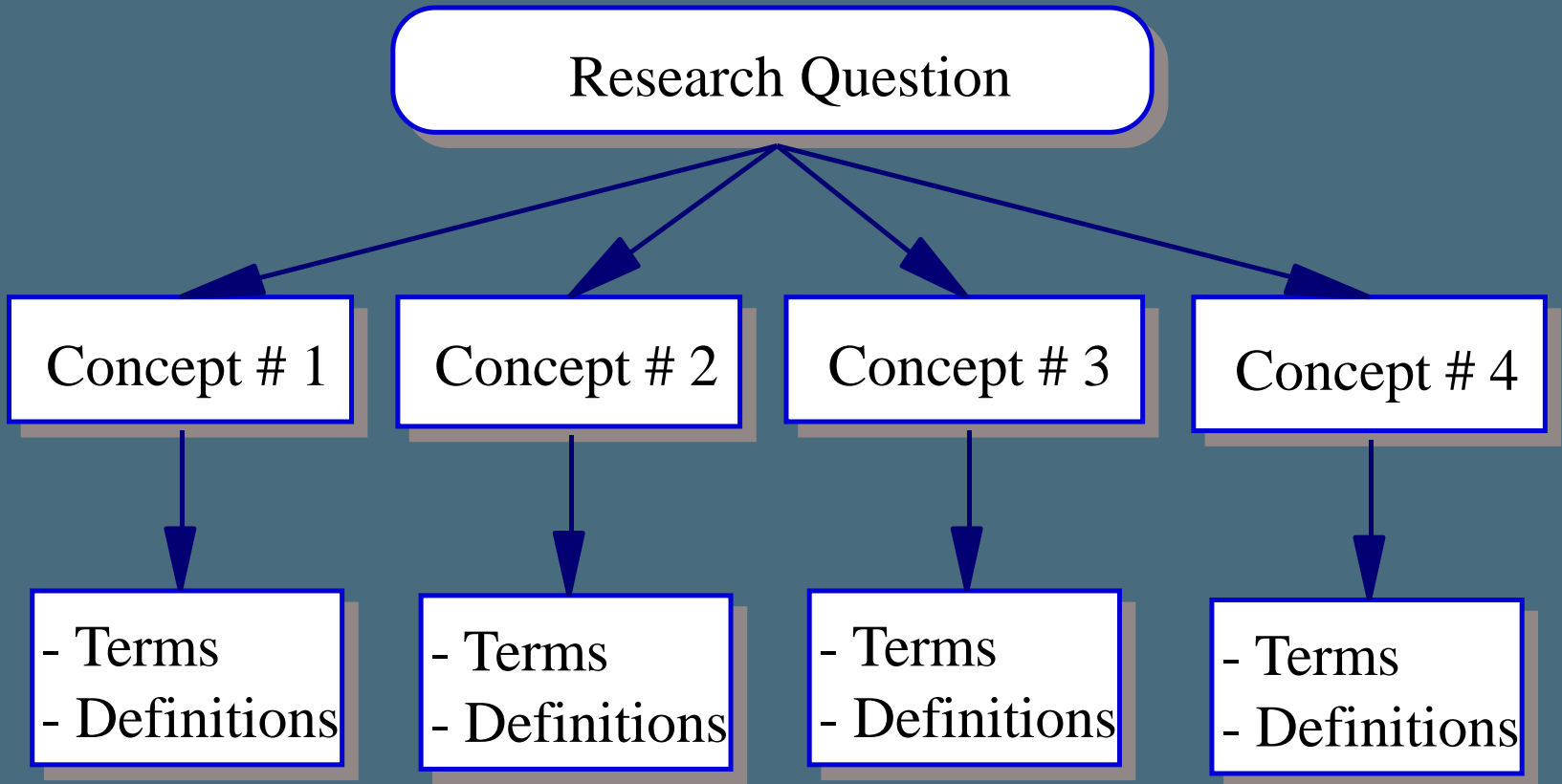
Slides adapted with permission from Mimi Doyle-Waters



a place of mind

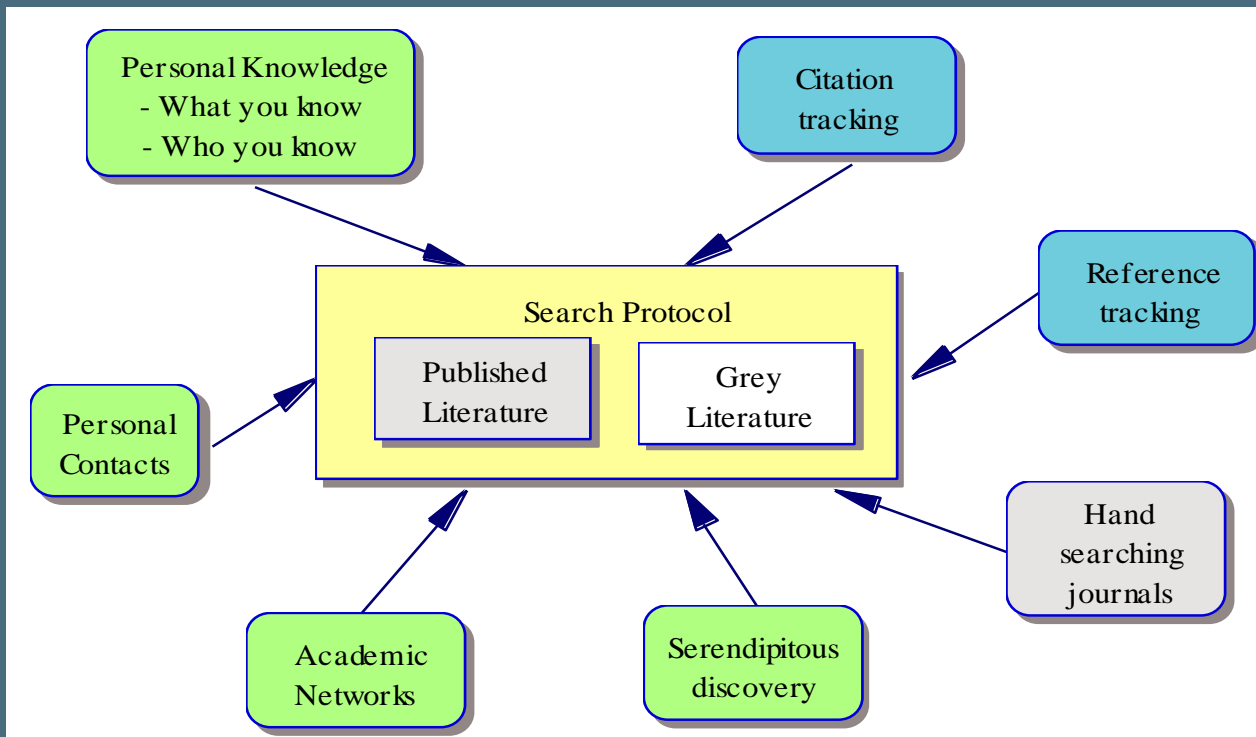
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A definable & measurable question

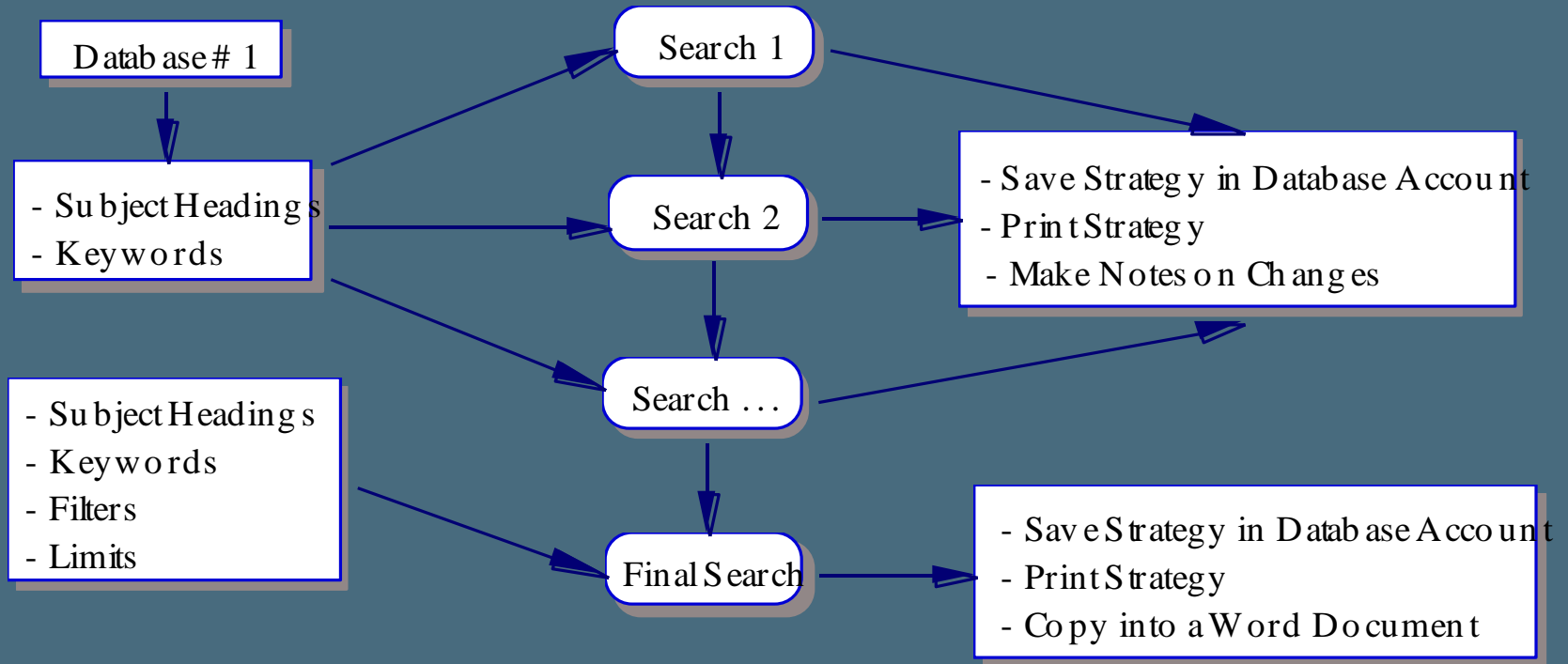


Search method

Greenhalgh T, Peacock R. Effectiveness and efficiency of search methods in systematic reviews of complex evidence: Audit of primary sources. *BMJ*. 2005 Nov 5;331(7524):1064-5.



Search strategy process = iterative



Developing a search template: An exercise in logic and linguistics

- 1) What is the full range of keywords, phrases and subject headings required to ensure that a concept is captured thoroughly?
- 2) How should specific keywords, phrases and subject headings be combined (AND, OR, NOT, adjacency) to capture discrete concepts in a logical way?



Subject headings: the bedrock of electronic database searching

- **Subject headings** (a.k.a. subject terms, controlled vocabulary, descriptors, indexing terms, indexing vocabulary) are standardized words or phrases assigned to an article to describe the contents of that article
- A **thesaurus** is a collection of subject headings
 - MeSH is the thesaurus in MEDLINE
 - 25,588 descriptors in 2010 MeSH. There are also over 172,000 entry terms.



When applying subject headings...

- Only the subject or descriptor **fields** within a database **record** are searched
- Tends to increase relevance of retrieved items
- **Indexing** is at the most specific level (i.e. explode goes from general to specific, not the other way around)
- **Explode** determines breadth of the concept
- **Subheadings** determine “angle” of the concept
- **Focus** determines emphasis on the concept
- Indexers are only human (for e.g. article about calves, as in part of the leg, indexed with Cattle/)

Example of synonym mapping

EMBASE

EMTREE TERM: Heart Infarction

Used For:

Cardiac Infarct
Cardiac Infarction
Cardial Infarct
Coronary Artery Acute Occlusion
Coronary Artery Occlusion
Coronary Occlusion
Heart Attack
Heart Infarct
Heart Micro Infarction
Heart Muscle Infarction

Infarction, Heart
Myocardial Infarct
Myocardial Infarction
Myocardium Infarct
Myocardium Infarction
Premonitory Infarction Sign
Second Heart Attack
Subendocardial Infarction
Transmural Cardiac Infarction
Transmural Heart Infarction
Transmural Infarction,Heart



Differences Between Thesauri

MEDLINE

<input checked="" type="checkbox"/>	Fractures, Bone	31857
[+]	<input type="checkbox"/> Femoral Fractures	9414
	<input type="checkbox"/> Fractures, Closed	2483
	<input type="checkbox"/> Fractures, Comminuted	883
	<input type="checkbox"/> Fractures, Compression	109
	<input type="checkbox"/> Fractures, Malunited	541
	<input type="checkbox"/> Fractures, Open	3533
	<input type="checkbox"/> Fractures, Spontaneous	4985
	<input type="checkbox"/> Fractures, Stress	1642
[+]	<input type="checkbox"/> Fractures, Ununited	3317
	<input type="checkbox"/> Hip Fractures	6654
	<input type="checkbox"/> Humeral Fractures	4210
[+]	<input type="checkbox"/> Radius Fractures	4460
	<input type="checkbox"/> Rib Fractures	1668
	<input type="checkbox"/> Shoulder Fractures	1312
[+]	<input type="checkbox"/> Skull Fractures	7312
	<input type="checkbox"/> Spinal Fractures	6052
	<input type="checkbox"/> Tibial Fractures	9265
[+]	<input type="checkbox"/> Ulna Fractures	1815

EMBASE

<input checked="" type="checkbox"/>	Fracture	14852
[+]	[Associated Terms]	
	<input type="checkbox"/> Avulsion Fracture	705
	<input type="checkbox"/> Clavicle Fracture	775
	<input type="checkbox"/> Comminuted Fracture	904
	<input type="checkbox"/> Compound Fracture	152
	<input type="checkbox"/> Foot Fracture	59
	<input type="checkbox"/> Fracture Dislocation	1468
	<input type="checkbox"/> Fragility Fracture	1661
	<input type="checkbox"/> Intraarticular Fracture	553
	<input type="checkbox"/> Joint Fracture	207
	<input type="checkbox"/> Limb Fracture	365
	<input type="checkbox"/> Open Fracture	1289
	<input type="checkbox"/> Pathologic Fracture	1805
	<input type="checkbox"/> Stress Fracture	2322
[+]	<input type="checkbox"/> Arm Fracture	419
[+]	<input type="checkbox"/> Face Fracture	876
[+]	<input type="checkbox"/> Fracture Healing	6496
[+]	<input type="checkbox"/> Leg Fracture	932
[+]	<input type="checkbox"/> Pelvis Fracture	1907
[+]	<input type="checkbox"/> Rib Fracture	1266
[+]	<input type="checkbox"/> Skull Fracture	1875
[+]	<input type="checkbox"/> Spine Fracture	2700



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Explode (capture narrower terms) vs. Focus (place emphasis on a term)

MEDLINE

	[+]	<input type="checkbox"/>	Hepatitis, Viral, Animal	1198	<input type="checkbox"/>	<input type="checkbox"/>	i
	[-]	<input type="checkbox"/>	Hepatitis, Viral, Human	9062	<input type="checkbox"/>	<input type="checkbox"/>	i
		<input type="checkbox"/>	Hepatitis A	12724	<input type="checkbox"/>	<input type="checkbox"/>	i
	[+]	<input type="checkbox"/>	Hepatitis B	29771	<input type="checkbox"/>	<input type="checkbox"/>	i
	[-]	<input checked="" type="checkbox"/>	Hepatitis C	21413	<input checked="" type="checkbox"/>	<input type="checkbox"/>	i
		<input type="checkbox"/>	Hepatitis C, Chronic	7614	<input type="checkbox"/>	<input type="checkbox"/>	i
	[+]	<input type="checkbox"/>	Hepatitis D	2237	<input type="checkbox"/>	<input type="checkbox"/>	i
		<input type="checkbox"/>	Hepatitis E	1119	<input type="checkbox"/>	<input type="checkbox"/>	i
	[+]	<input type="checkbox"/>	Meningitis, Viral	1843	<input type="checkbox"/>	<input type="checkbox"/>	i

Scope Notes

MEDLINE

MeSH HEADING: HIP FRACTURES

SCOPE: Fractures of the FEMUR HEAD; the FEMUR NECK; (FEMORAL NECK FRACTURES); the trochanters; or the inter- or subtrochanteric region. Excludes fractures of the acetabulum and fractures of the femoral shaft below the subtrochanteric region (FEMORAL FRACTURES).

NOTE: GEN or unspecified; note X refs: fract below subtrochant = FEMORAL FRACTURES; FEMORAL NECK FRACTURES is available; femur head fract = FEMUR HEAD /inj (IM) + HIP FRACTURES (IM); acetabular fract = ACETABULUM /inj (IM) + FRACTURES, BONE (IM)

YEAR of ENTRY: 78

PREVIOUS INDEXING: Femoral Fractures (1966-1977); Fractures (1966-1977)

REFERENCES:

Used For:

intertrochanteric fractures
subtrochanteric fractures
trochanteric fractures



Keyword Searching

- **Not** pre-defined or standardized
- Can search the subject, title, author, abstract, and other fields
- May be search words, parts of words, phrases, names, or combinations of all of these
- May retrieve large number of irrelevant items
- Need to include all possible synonyms, alternate terminology; variant word endings (e.g. singular, plural, adjectives); variant spelling (UK, US)
- Very useful when there's no appropriate subject heading (for e.g. minimal clinically important difference) or with very new concept



Keyword vs. Subject Search

MEDLINE

Personal Account Name: **teaching**

#	Search History	Results
1	heart attack.mp. [mp=title, original title, abstract, name of substance word, subject heading word]	1789
2	aspirin.mp. [mp=title, original title, abstract, name of substance word, subject heading word]	38228
3	1 and 2	70
4	exp Myocardial Infarction/	111326
5	Aspirin/	29123
6	4 and 5	2297

 [Combine Searches](#) |
  [Delete Searches](#) |
  [Save Search/Alert](#)



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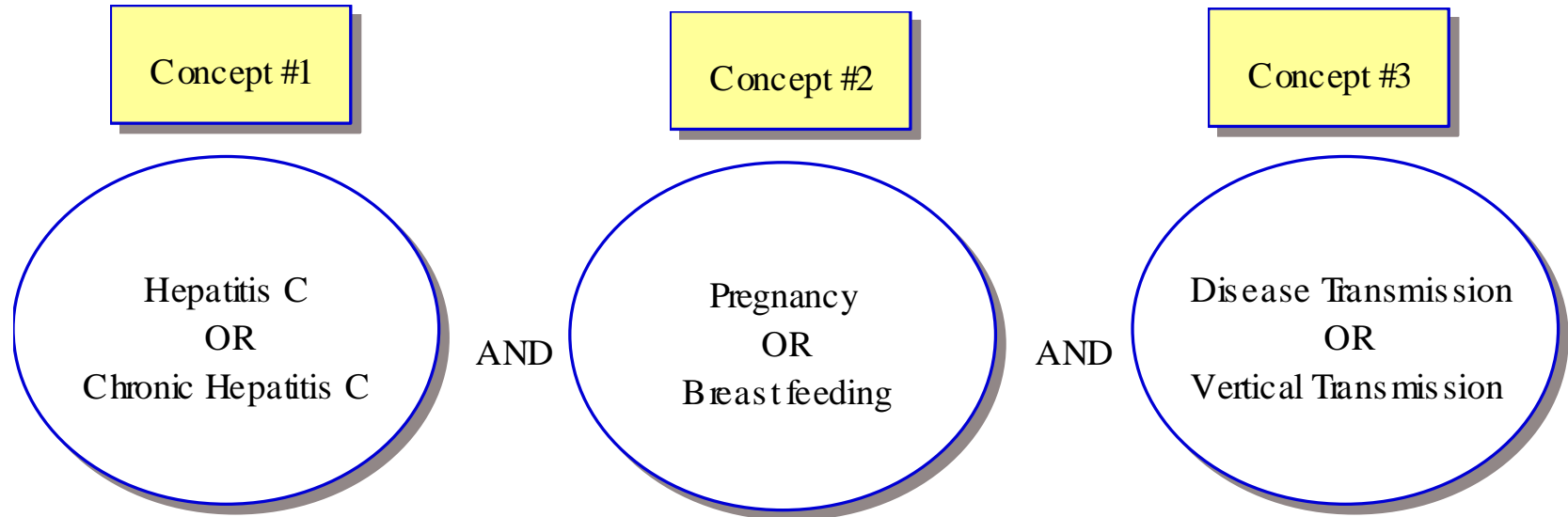
What are the effects (benefits and harms) of pre-operative traction to the injured limb following an acute fracture of the proximal femur in adults? Different methods of applying traction (skin or skeletal) will be considered

Database: Ovid MEDLINE(R) 1966 to Present with Daily Update
Search Strategy:

```
-----  
1      exp Hip Fractures/ (11380)  
2      ((hip$ or femur$ or femoral$ or trochant$ or  
perthrochant$ or intertrochant$ or subtrochant$ or  
intracapsular$ or extracapsular$) adj4 fracture$).tw. (16010)  
3      or/1-2 (19146)  
4      (pin$1 or nail$ or screw$1 or plate$1 or arthroplast$ or  
fix$ or prothes$).tw. (308515)  
5      Bone Screws/ (10806)  
6      Bone Nails/ (6393)  
7      Bone Plates/ (7944)  
8      Internal Fixators/ (3124)  
9      Fracture Fixation, Internal/ (16506)  
10     Arthroplasty/ or Arthroplasty, Replacement, Hip/  
(11347)  
11     or/4-10 (323944)  
12     3 and 11 (8037)
```

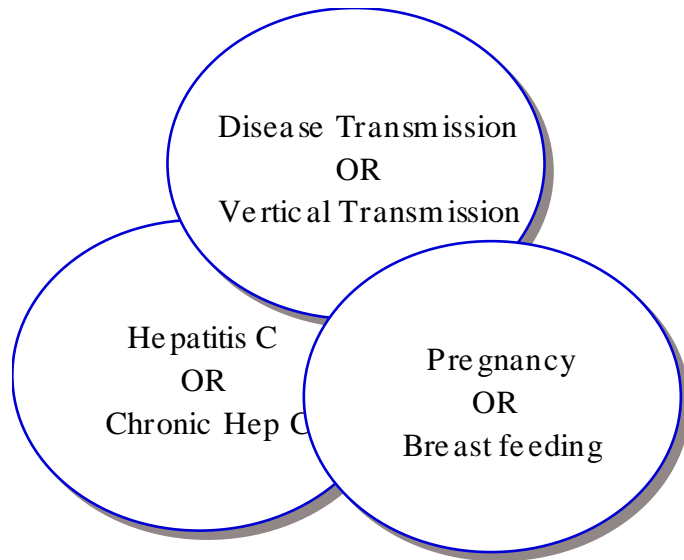
Boolean Logic

Question: Is hepatitis C transmitted from mother to child during the prenatal and postnatal period?



Boolean Logic

Combining Concepts Using AND



Personal Account Name: **teaching**

#	Search History	Results
1	hepatitis c/ or hepatitis c, chronic/	28670
2	exp pregnancy/	557839
3	Breast Feeding/	18312
4	2 or 3	570553
5	Disease Transmission, Vertical/	7212
6	Disease Transmission/	1150
7	5 or 6	8360
8	1 and 4	703
9	1 and 4 and 7	260

Search Filters

- Pre-formulated, pre-tested strategies
- Can help identify the higher quality evidence
- Available for most experimental designs
- Apply to the designated database
- Available through variety of sources: for example, Centre for Reviews and Dissemination:
<http://www.york.ac.uk/inst/crd/intertasc/index.htm>



An example: Observational Studies Filter

- 1 Epidemiologic studies/
- 2 Exp case control studies/
- 3 Exp cohort studies/
- 4 Case control.tw.
- 5 (cohort adj (study or studies)).tw.
- 6 Cohort analy\$.tw.
- 7 (Follow up adj (study or studies)).tw.
- 8 (observational adj (study or studies)).tw.
- 9 Longitudinal.tw.
- 10 Retrospective.tw.
- 11 Cross sectional.tw.
- 12 Cross-sectional studies/
- 13 Or/1-12

