JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

Section C

Building a High-Quality Search Strategy

Agenda

- Building a Medline search
- Finding MeSH and other PubMed record elements
- Creating a MeSH/Text word chart
- Controlling your search with field tags and other database tools
- Using study design filters
- Using the PRESS checklist

Development of MEDLINE Search Strategy

1. Start with simple search strategy
2. Run search, and retrieve reports
3. Analyze MeSH and keywords of studies fitting your criteria, and revise strategy
4. Re-run search with revised strategy
5. Repeat steps 2 through 4 if necessary
6. Run optimal search strategy
7. Retrieve reports identified with optimal search strategy

Developing Simple Search Strategy

- To develop simple search strategy …
  - Start with your question
  - Break into concepts
    - **P**opulation
    - **I**ntervention(s)
    - **C**omparison(s)
    - **O**utcome

Developing Simple Search Strategy: Example

- For patients with choroidal neovascularization associated with age-related macular degeneration, do intravitreal injections of Lucentis (Genentech), when compared with Avastin (Genentech), prevent vision loss?

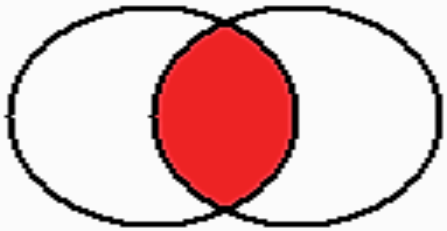
P	Individuals with choroidal neovascularization associated with age-related macular degeneration
I	Lucentis (ranibizumab)
C	Avastin (bevacizumab)
O	Change in visual acuity or visual field

Searching PubMed

- Start with the general format:
  - (**P**opulation OR synonym #1 OR synonym #2) AND
  - (**I**ntervention OR synonym #1 OR synonym #2) AND
  - (**C**omparator OR synonym #1 OR synonym #2) AND
  - (**O**utcome OR synonym #1 OR synonym #2) AND

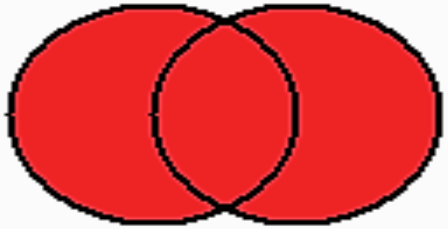
- Add study type filter terms

Boolean Searching



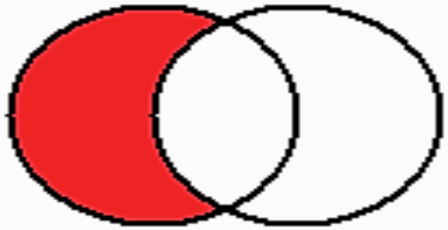
AND

Macular degeneration AND intravitreal injections



OR

Lucentis OR ranibizumab

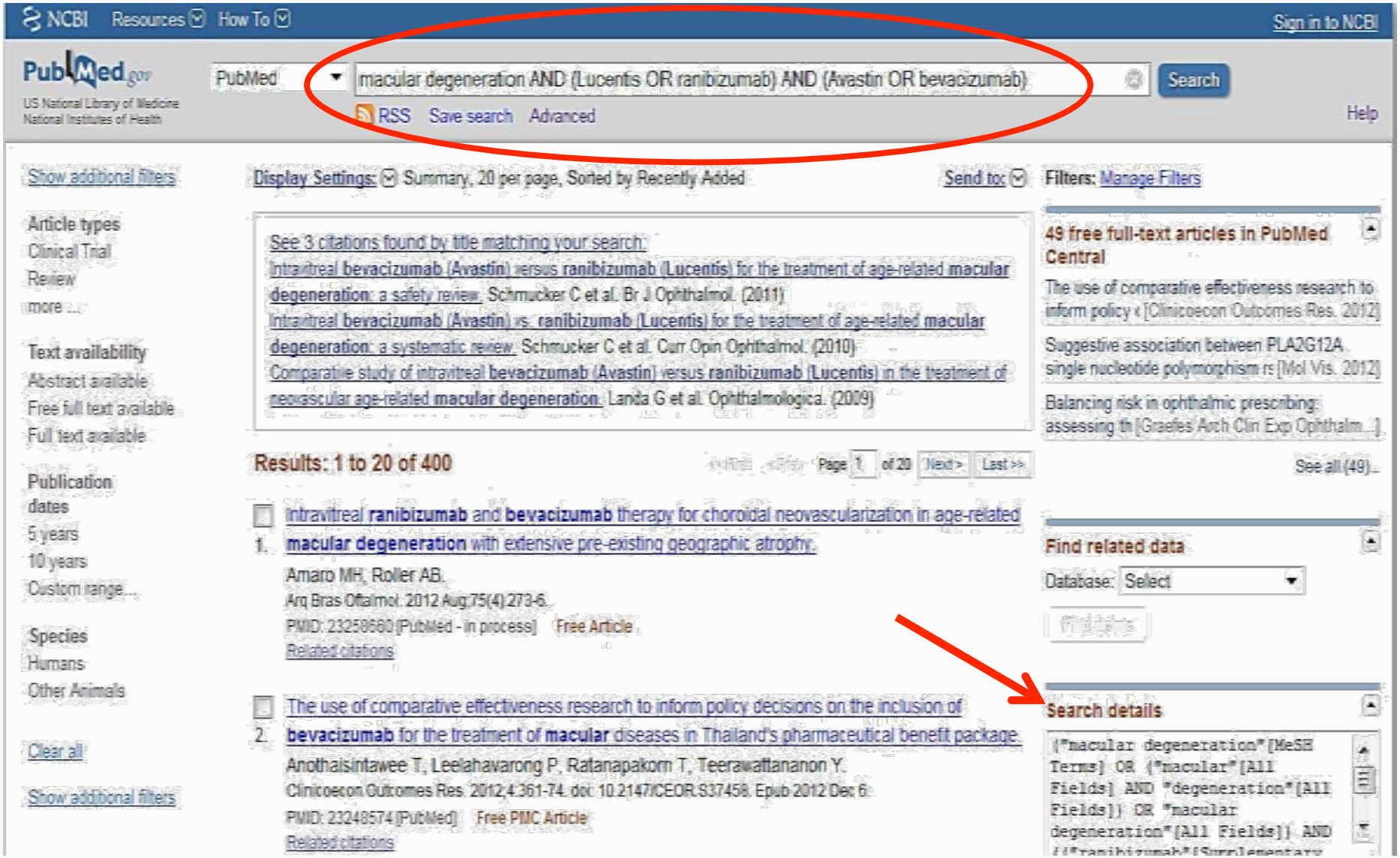


NOT

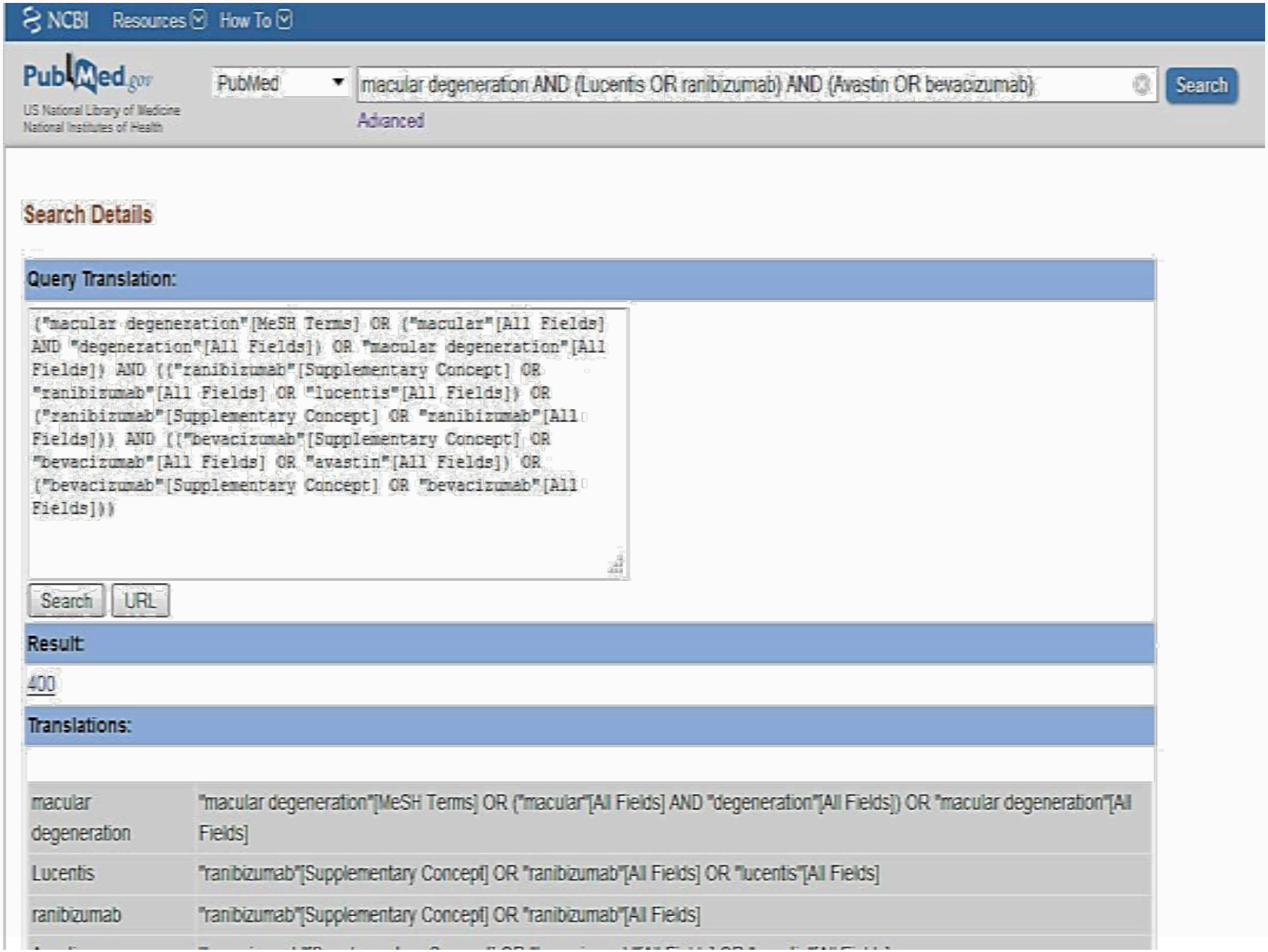
Search #1 NOT Search #2

(use as tool to evaluate searches only)

Boolean Searching in PubMed



Boolean Searching in PubMed



Beginning of PubMed Record

NCBI Resources How To MyNCBI Sign In

PubMed.gov
US National Library of Medicine
National Institutes of Health

PubMed Search

Limits Advanced Help

Display Settings: Abstract Send to:

N Engl J Med. 2011 May 19;364(20):1897-908. Epub 2011 Apr 28.

Ranibizumab and bevacizumab for neovascular age-related macular degeneration.

CATT Research Group, Martin DF, Maguire MG, Ying GS, Grunwald JE, Fine SL, Jaffe GJ.

Collaborators (861)

Abstract

BACKGROUND: Clinical trials have established the efficacy of ranibizumab for the treatment of neovascular age-related macular degeneration (AMD). In addition, bevacizumab is used off-label to treat AMD, despite the absence of similar supporting e

METHODS: In a multicenter, single-blind, noninferiority trial, we randomly assigned 1208 patients with neovascular AMD to receive intravitreal injections of ranibizumab or bevacizumab on either a monthly schedule or as needed with monthly evaluation. The primary outcome was the mean change in visual acuity at 1 year, with a noninferiority limit of 5 letters on the eye chart.

RESULTS: Bevacizumab administered monthly was equivalent to ranibizumab administered month , with 8.0 and 8.5 letters gained, respectively. Bevacizumab administered as needed was equivalent to ranibizumab as needed, with 5.9 and 6.8 letters gained, respectively. Ranibizumab as needed was equivalent to monthly ranibizumab, although the comparison between bevacizumab as needed and monthly bevacizumab was inconclusive. The mean decrease in central retinal thickness was greater in the ranibizumab-monthly group (196 µm) than in the other groups (152 to 168 µm, P=0.03 by analysis of variance). Rates of death, myocardial infarction, and stroke were similar for patients receiving either bevacizumab or ranibizumab (P>0.20). The proportion of patients with serious systemic adverse events (primarily hospitalizations) was higher with bevacizumab than with ranibizumab (24.1% vs. 19.0%; risk ratio, 1.29; 95% confidence interval, 1.01 to 1.66), with excess events broadly distributed in disease categories not identified in previous studies as areas of concern.

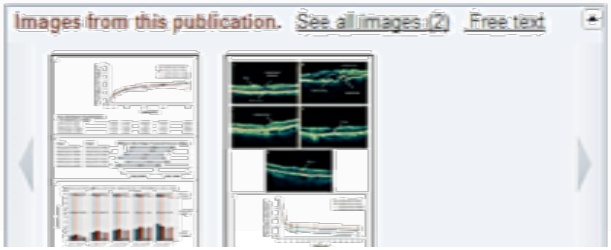
CONCLUSIONS: At 1 year, bevacizumab and ranibizumab had equivalent effects on visual acuity when administered according to the same schedule. Ranibizumab given as needed with monthly evaluation had effects on vision that were equivalent to those of ranibizumab administered monthly. Differences in rates of serious adverse events require further study. (Funded by the National Eye Institute; ClinicalTrials.gov number, NCT00593450.).

Comment in

N Engl J Med. 2011 Dec 8;365(23):2237; author reply 2237.
N Engl J Med. 2011 Dec 8;365(23):2238.
N Engl J Med. 2011 May 19;364(20):1966-7.

PMID: 21526923 [PubMed - indexed for MEDLINE] PMCID: PMC3157322 Free PMC Artic

Images from this publication. See all images (2) Free text



Keywords

NEJM FREE FULL TEXT FREE Author Manuscript in PubMed Central

JHU FULL-TEXT FIND IT @ JH

Related citations

Bevacizumab for neovascular age-related macular degeneration (ABC Trial): multicentre [BMJ. 2010]

Ranibizumab for neovascular age-related macular degeneration. [N Engl J Med. 2006]

Ranibizumab versus verteporfin for neovascular age-related macular degene [N Engl J Med. 2006]

Review Ranibizumab and pegaptanib for the treatment of age-r [Health Technol Assess. 2008]

Review Ranibizumab: Phase III clinical trial results. [Ophthalmol Clin North Am. 2006]

See reviews...

See all...

Cited by 6 PubMed Central articles

Antivascular endothelial growth factor agents for neovascular age-related mac [J Ophthalmol. 2012]

Management of neovascular age-related macular degeneration in clinical prac [J Ophthalmol. 2011]

One-year outcomes using ranibizumab for neovascular age-related mac [J Ophthalmol. 2011]

See all...

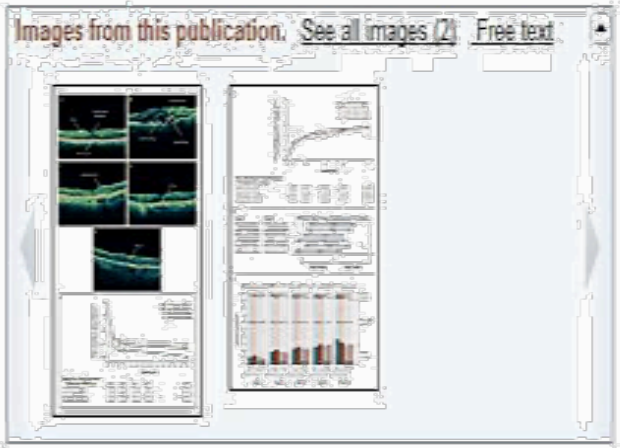
Related information

Related Citations
References for this PMC Article
Substance (MeSH Keyword)
Free in PMC
Cited in PMC

Bottom of PubMed Record

PMID: 21528623 [PubMed - indexed for MEDLINE] PMCID: PMC3157322 Free PMC Article

Images from this publication. See all images (2) Free text



Publication Types, MeSH Terms, Substances, Secondary Source ID, Grant Support

LinkOut - more resources

Cited by 52 PubMed Central articles

Establishing equivalence or non-inferiority in clinical trials: part 20 of a [Dtsch Arztebl Int. 2012]

Comparison of Systemic Adverse Events Associated with Intravit [J Korean Med Sci. 2012]

Fixed Monthly versus Less Frequent Ranibizumab Dosing and Pr [J Ophthalmol. 2012]

See all...

Related information

Related Citations

References for this PMC Article

Substance (MeSH Keyword)

Free in PMC

Cited in PMC

Search details

2011[pdat] AND "ranibizumab" AND martin[au]

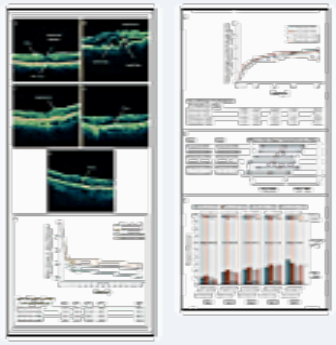
Search

See more...

Bottom of PubMed Record

PMID: 21526923 [PubMed - indexed for MEDLINE] PMCID: PMC3157322 Free PMC Article

Images from this publication. See all images (2) Free text



Publication Types, MeSH Terms, Substances, Secondary Source ID, Grant Support

Publication Types
Comparative Study
Multicenter Study
Randomized Controlled Trial
Research Support, N.I.H., Extramural

MeSH Terms
Aged
Aged, 80 and over
Antibodies, Monoclonal/adverse effects
Antibodies, Monoclonal/pharmacology
Antibodies, Monoclonal/therapeutic use*
Antibodies, Monoclonal, Humanized
Cardiovascular Diseases/epidemiology
Drug Administration Schedule
Female
Humans
Intention to Treat Analysis

Cited by 51 PubMed Central articles

Comparison of Systemic Adverse Events Associated with Intravit [J Korean Med Sci. 2012]

Fixed Monthly versus Less Frequent Ranibizumab Dosing and Pr [J Ophthalmol. 2012]

The use of comparative effectiveness research to inform policy [Clinicoecon Outcomes Res. 2012]

See all...

Related information

Related Citations
References for this PMC Article
Substance (MeSH Keyword)
Free in PMC
Cited in PMC

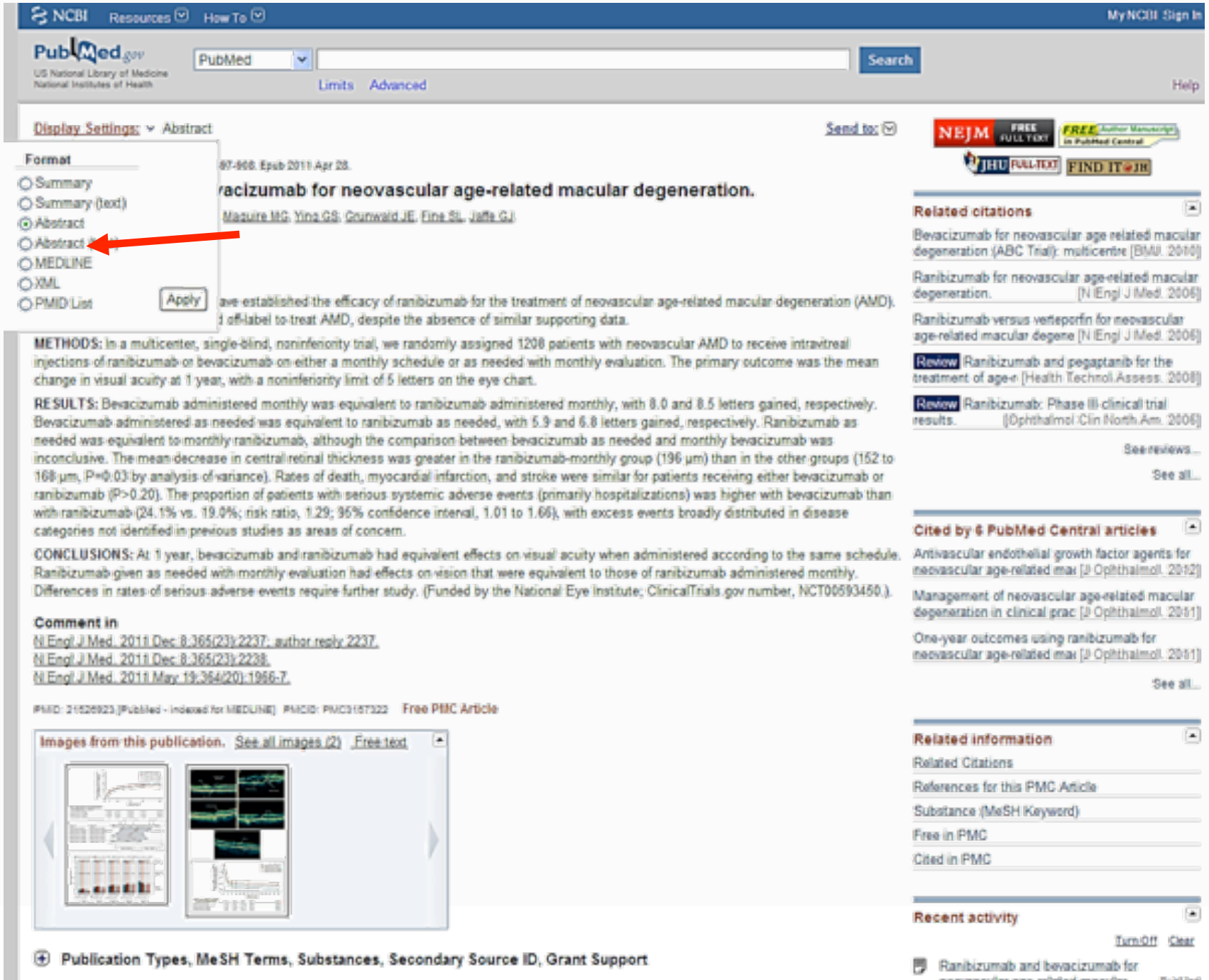
Search details

21526923[uid]

Search

See more...

PubMed Display Formats

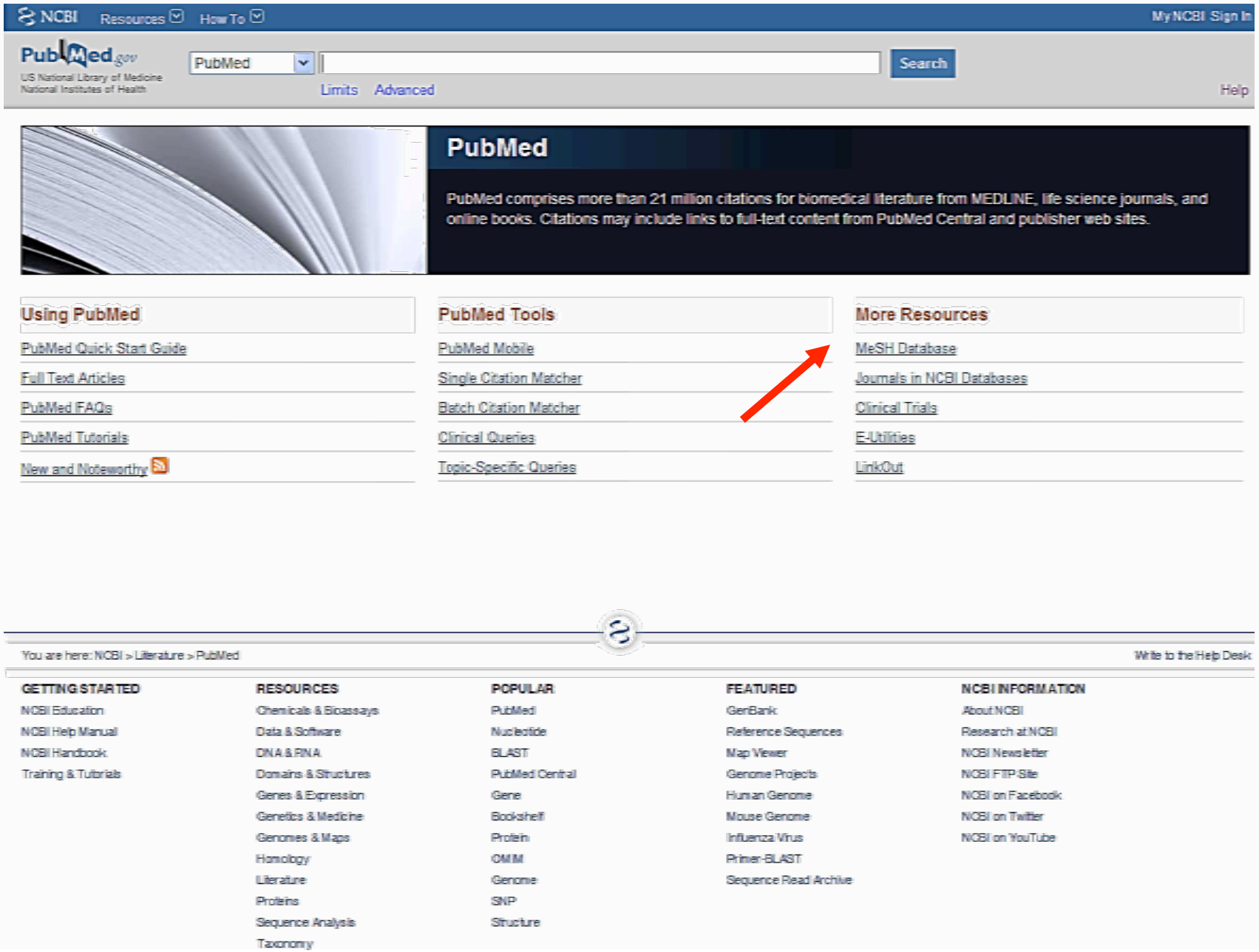


MH-MeSH Terms in Known Articles

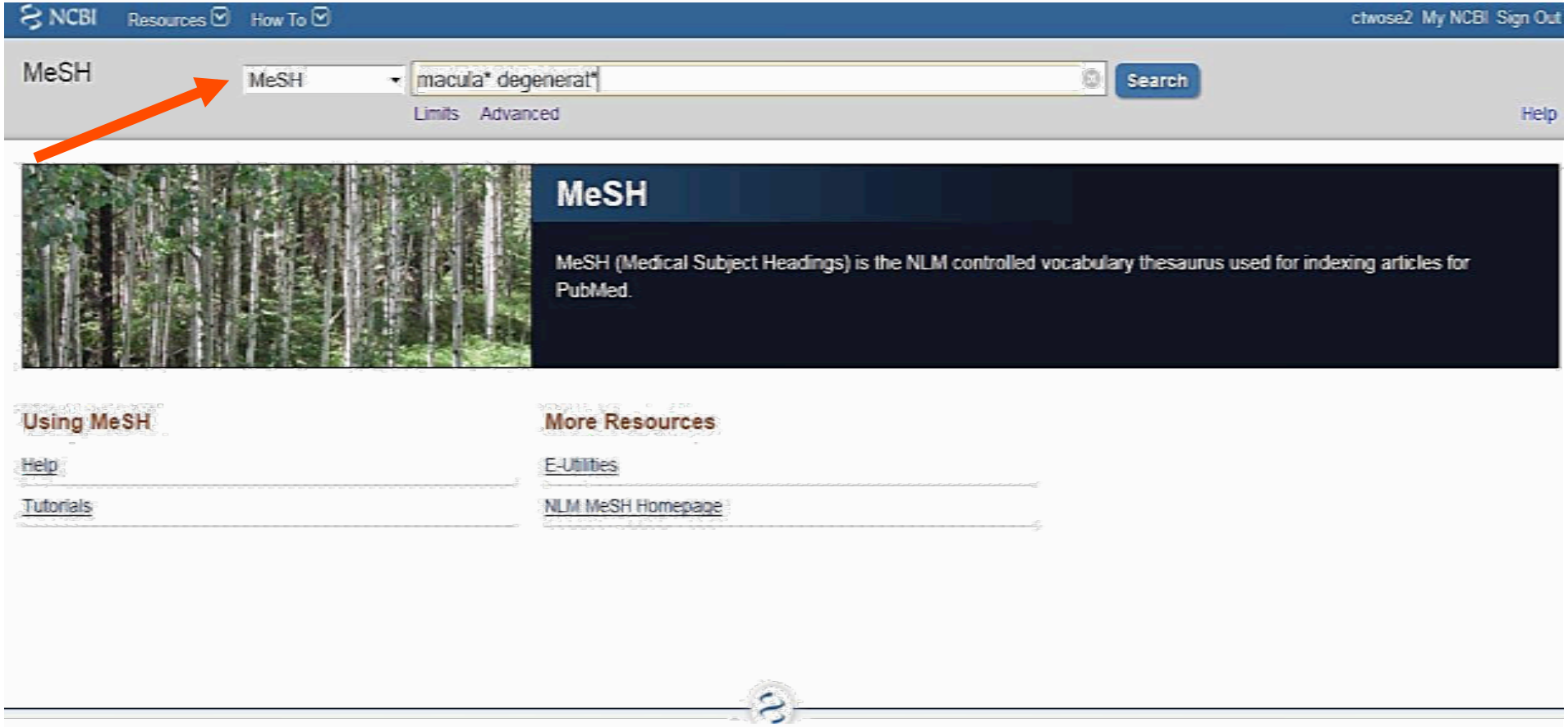
Use the MH – MeSH terms in known articles to build your search strategy

```
AU  - Jaffe GJ
LA  - eng
SI  - ClinicalTrials.gov/NCT00593450
GR  - U10-EY017823/EY/NEI NIH HHS/United States
GR  - U10-EY017825/EY/NEI NIH HHS/United States
GR  - U10-EY017826/EY/NEI NIH HHS/United States
GR  - U10-EY017828/EY/NEI NIH HHS/United States
PT  - Comparative Study
PT  - Journal Article
PT  - Multicenter Study
PT  - Randomized Controlled Trial
PT  - Research Support, N.I.H., Extramural
DEP - 20110428
PL  - United States
TA  - N Engl J Med
JT  - The New England journal of medicine
JID - 0255562
RN  - 0 (Antibodies, Monoclonal)
RN  - 0 (bevacizumab)
RN  - 0 (ranibizumab)
SB  - AIM
SB  - IM
CIN - N Engl J Med. 2011 May 19;364(20):1966-7. PMID: 21526924
MH  - Aged
MH  - Aged, 80 and over
MH  - Antibodies, Monoclonal/adverse effects/pharmacology/*therapeutic use
MH  - Cardiovascular Diseases/epidemiology
MH  - Drug Administration Schedule
MH  - Female
MH  - Humans
MH  - Intention to Treat Analysis
MH  - Macular Degeneration/*drug therapy/pathology
MH  - Male
MH  - Middle Aged
MH  - Off-Label Use
MH  - Proportional Hazards Models
MH  - Retina/drug effects/pathology
MH  - Single-Blind Method
MH  - Therapeutic Equivalency
MH  - Visual Acuity/drug effects
IR  - Williams DF
FIR - Williams, David F
IR  - Beardsley S
FIR - Beardsley, Sara
```

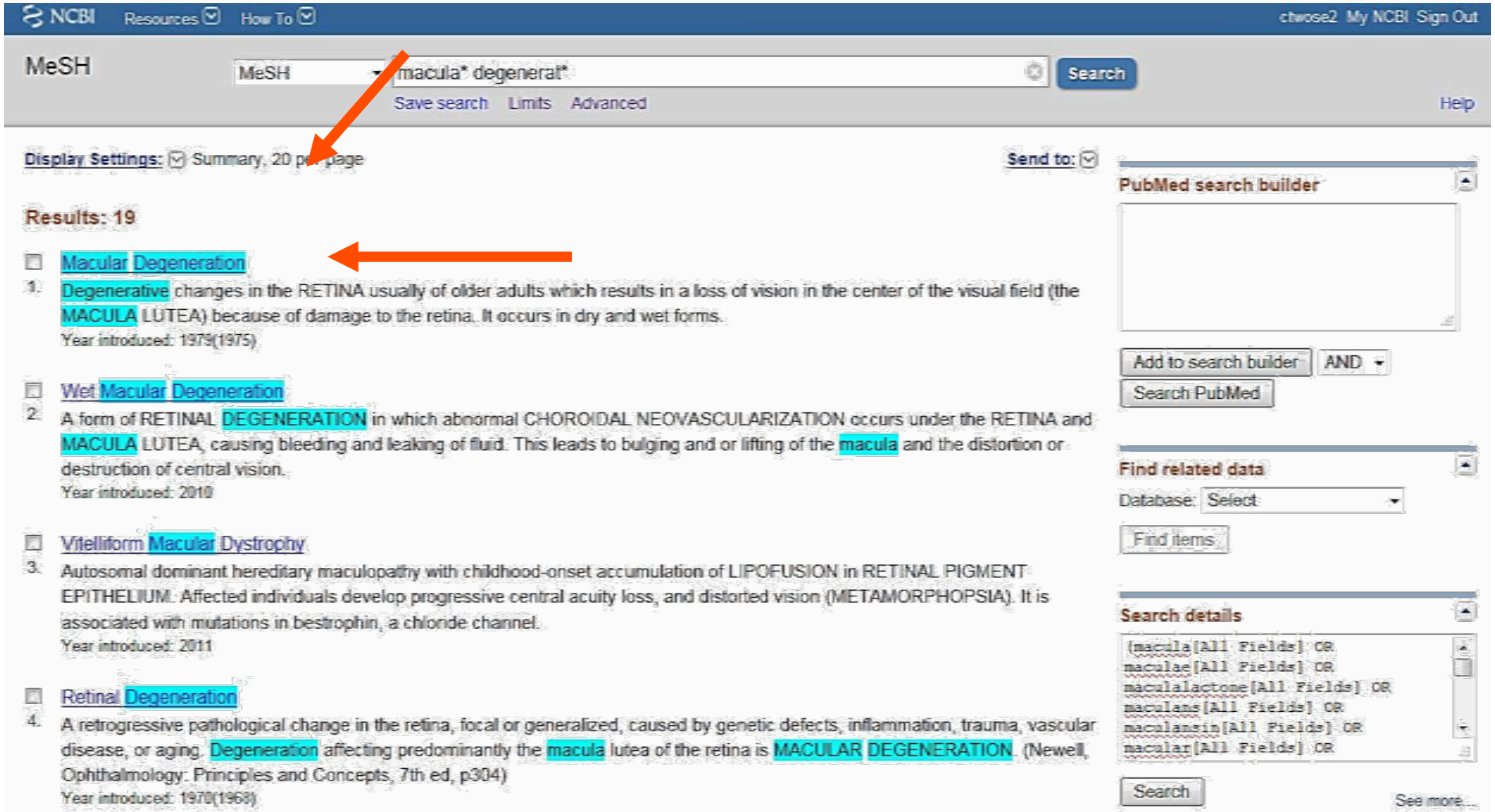
MeSH Database



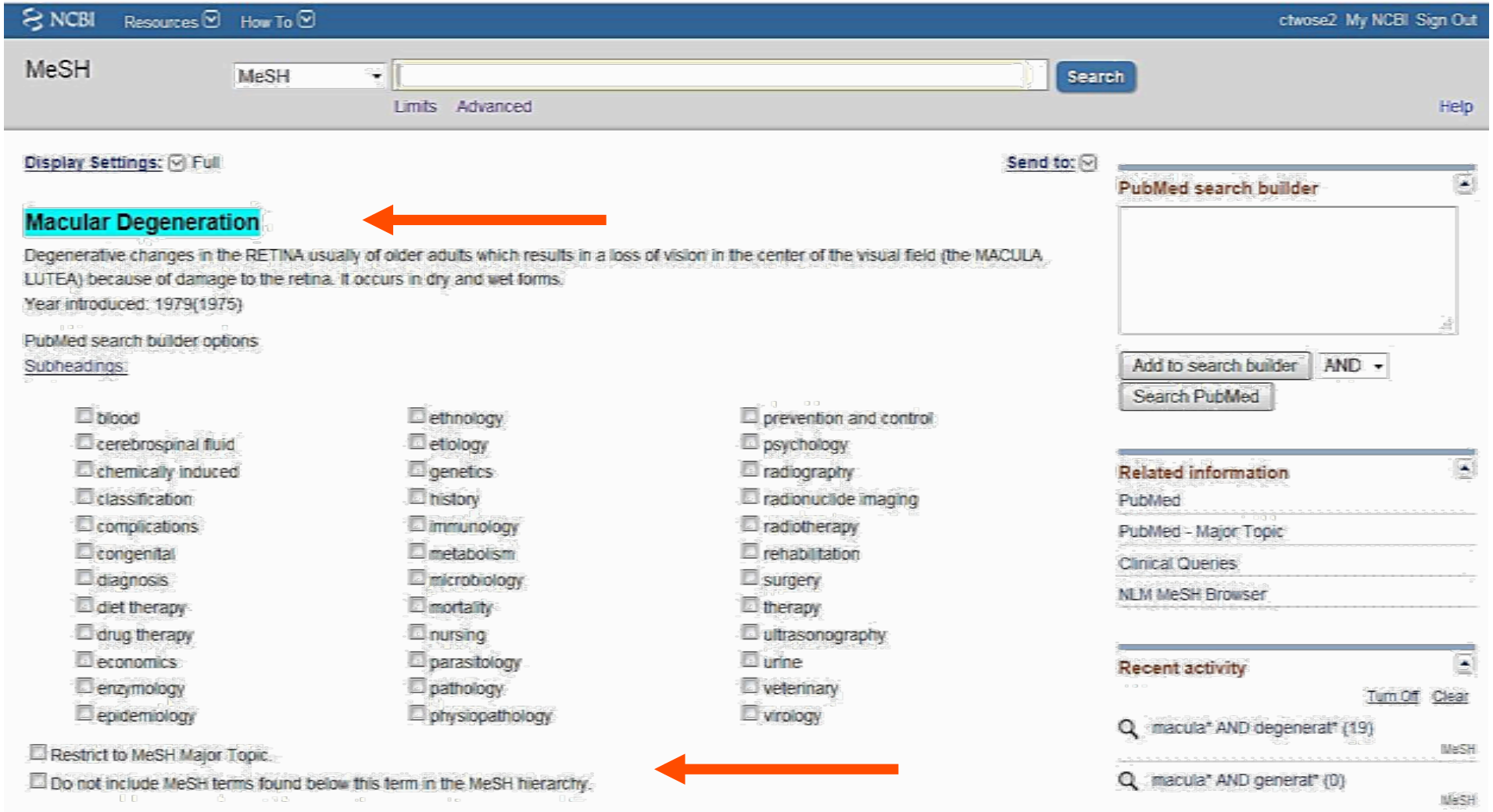
MeSH Database



MeSH Database



Beginning of MeSH Term Entry Page



End of MeSH Term Entry Page

Entry Terms:

- Degeneration, Macular
- Degenerations, Macular
- Macular Degenerations
- Age-Related Maculopathies
- Age Related Maculopathies
- Maculopathy, Age-Related
- Maculopathy, Age Related
- Macular Dystrophy
- Dystrophies, Macular
- Dystrophy, Macular
- Macular Dystrophies
- Maculopathies, Age-Related
- Maculopathies, Age Related
- Age-Related Macular Degeneration
- Age Related Macular Degeneration
- Age-Related Macular Degenerations
- Degeneration, Age-Related Macular
- Degenerations, Age-Related Macular
- Macular Degeneration, Age-Related
- Macular Degenerations, Age-Related
- Age-Related Maculopathy
- Age Related Maculopathy

Previous Indexing:

- Retinal Degeneration (1970-1978)

See Also:

- Vitelliform Macular Dystrophy

All MeSH Categories

Diseases Category

Eye Diseases

Retinal Diseases

Retinal Degeneration

Macular Degeneration

Geographic Atrophy

Macular Degeneration
MeSH

macular degeneration (9)
MeSH

(randomized controlled trial[pt] OR controlled clinical trial[pt]... (2499959 PubMed

See more...

MeSH and Keyword Analysis

	Angiogenesis inhibitors	Antibodies monoclonal	Choroidal neovascu-larization	Macular degeneration	Visual acuity	Visual fields
CATT		X		X		
Paper 2	X		X			X
Paper 3			X			
Paper 4	X	X			X	X
Paper 5		X			X	

PubMed: Common Field Tags

MeSH	mh
Text word	tw
Title and abstract	tiab
Title	ti
Date	dp
Author	au
Publication type	pt
All fields	all

- http://www.ncbi.nlm.nih.gov.proxy3.library.jhu.edu/books/NBK3827/#pubmedhelp.Search_Field_Description

Add to Search Strategy

- Plurals
  - Acuity, acuities
- Abbreviations
  - CNV for choroidal neovascularization
- Synonyms
  - Lucentis, ranibizumab
  - Avastin, bevacizumab
- Spelling variations
  - Randomized/randomised
- Truncation
  - Antibod* for antibody or antibodies

Impact of Limiting by Language in Systematic Reviews

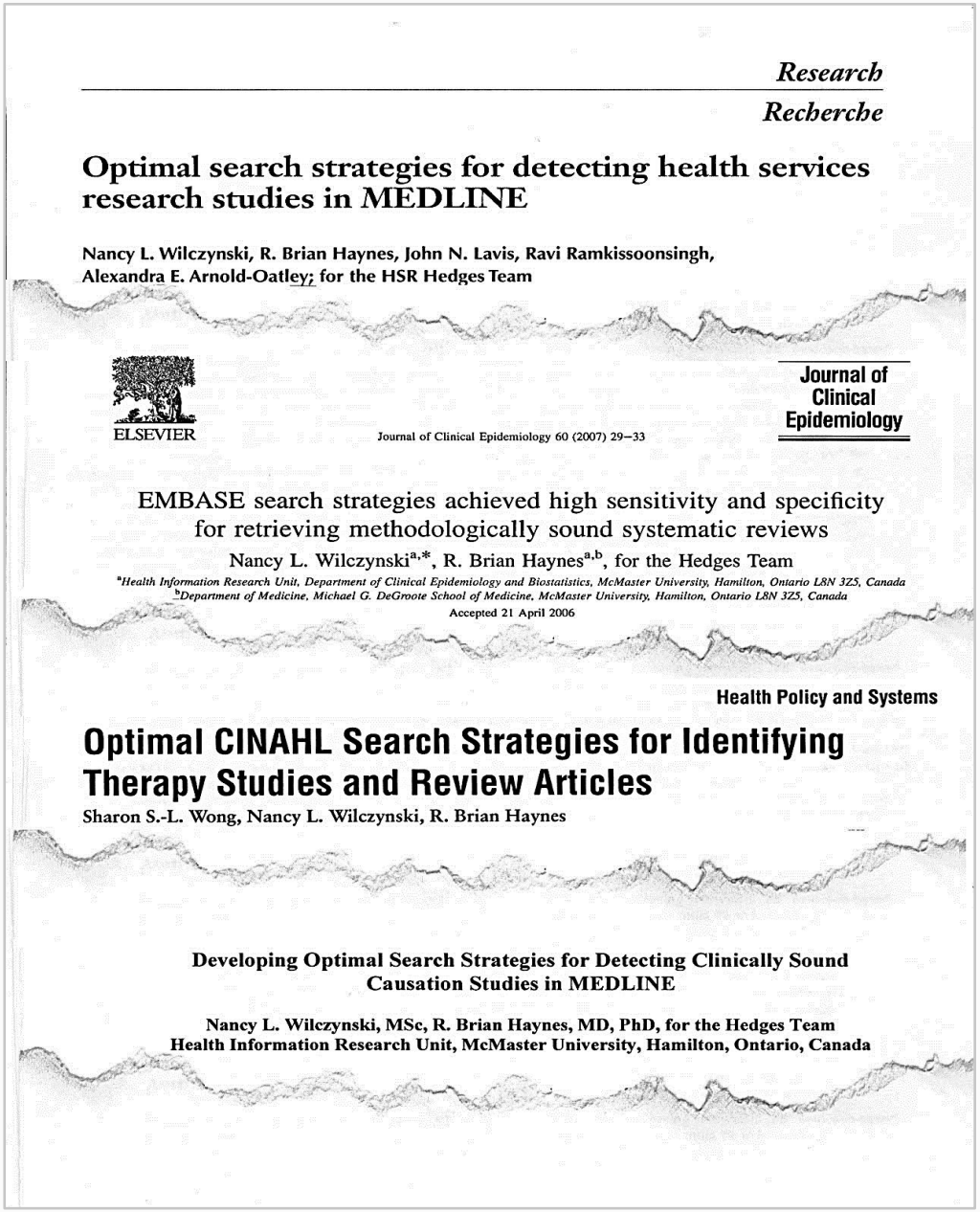
- **Yes,** for German-speaking authors publishing in both languages (Egger, et al., 1997)
- **Yes,** for reports in complementary medicine from China, Russia, and Taiwan (Vickers, et al., 1998)
- **No,** for Cochrane reviews employing comprehensive searches (Juni, et al., 2002)

Cochrane Highly Sensitive Search Strategy for RCTs

- Box 6.4.a: Cochrane Highly Sensitive Search Strategy for identifying randomized trials in MEDLINE: sensitivity-maximizing version (2008 revision); PubMed format
  - (randomized controlled trial [pt] OR controlled clinical trial [pt] OR randomized [tiab] OR placebo [tiab] OR drug therapy [sh] OR randomly [tiab] OR trial [tiab] OR groups [tiab]) NOT (animals [mh] NOT humans [mh])

Searching for Observational Studies

- Useful articles on searching for observational studies



Research

Recherche

Optimal search strategies for detecting health services research studies in MEDLINE

Nancy L. Wilczynski, R. Brian Haynes, John N. Lavis, Ravi Ramkissoonsingh, Alexandra E. Arnold-Oatley; for the HSR Hedges Team

ELSEVIER

Journal of Clinical Epidemiology

Journal of Clinical Epidemiology 60 (2007) 29–33

EMBASE search strategies achieved high sensitivity and specificity for retrieving methodologically sound systematic reviews

Nancy L. Wilczynski[a,*], R. Brian Haynes[a,b], for the Hedges Team

[a]Health Information Research Unit, Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario L8N 3Z5, Canada
[b]Department of Medicine, Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario L8N 3Z5, Canada

Accepted 21 April 2006

Health Policy and Systems

Optimal CINAHL Search Strategies for Identifying Therapy Studies and Review Articles

Sharon S.-L. Wong, Nancy L. Wilczynski, R. Brian Haynes

Developing Optimal Search Strategies for Detecting Clinically Sound Causation Studies in MEDLINE

Nancy L. Wilczynski, MSc, R. Brian Haynes, MD, PhD, for the Hedges Team
Health Information Research Unit, McMaster University, Hamilton, Ontario, Canada

Completed Search Strategy

- This is added to the Cochrane "highly sensitive search strategy"

P

(macular degeneration [mh] OR retinal degeneration [mh] OR retinal neovascularization [mh] OR choroidal neovascularization [mh] OR macula lutea [mh] OR maculopath* [tw] OR ((macul* [tw] OR retina* [tw] OR choroid* [tw]) AND degener*.[tw]) OR ((macul* [tw] OR retina* [tw] OR choroid* [tw]) AND neovasc* [tw]) OR macula* lutea [tw])

AND

I, C

(angiogenesis inhibitors [mh] OR angiogenesis inducing agents [mh] OR vascular endothelial growth factors [mh] (lucentis$ or ranibizumab$ or bevacizumab$) [tw] OR anti VEGF* [tw] OR endothelial growth factor* [tw])

- Add study filter terms to identify study type

Tool: PRESS Checklist

- On the basis of extensive research reviewing 26 different tools for evaluating electronic searches, seven key criteria for assessing search quality have been developed (Sampson, et al., 2008)

Remember to Adapt Your Search

- EMBASE, Cochrane, LILACS, CINAHL, Web of Science
  - All require different search strategies
    - Sampson and McGowan, 2008

Summary: Searching Process

- Develop your search
  - Based on the defined clinical question
  - Break into concepts (PICO)
  - Find synonyms for terms
- Use Boolean logic:
  - OR synonyms
  - AND concepts
- Use controlled vocabulary when available
  - In PubMed, use MeSH and keywords found in citations to key articles, MeSH database
- Revise the search strategy
- Include tested study design filter if available
- Use PRESS tool to check search strategy

Looking Ahead

- Next section:
  - Documentation and conclusions