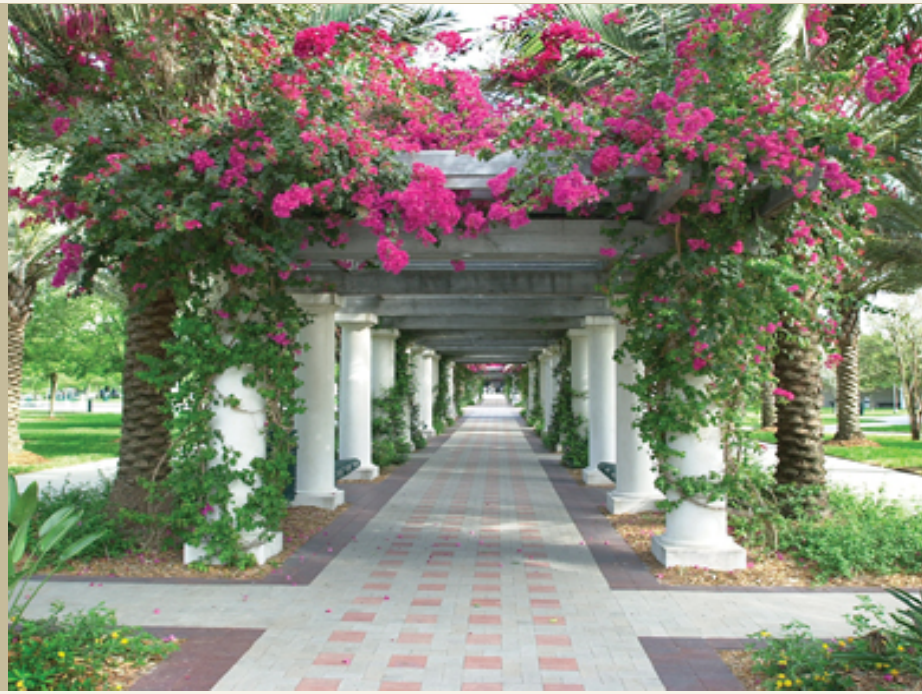
Searching for evidence



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May 1, 2013

USF HEALTH CENTER FOR EVIDENCE BASED MEDICINE

Outline

- Introduction
- Resources / Databases
- How to search
  - PubMed
  - TRIP Database
- Management of search results

Learning through play

- Try all “buttons”
- Make lots of “mistakes”
- Have fun

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Introduction

Foundations of informed healthcare are:

- assessment of knowledge gaps,
- question formulation,
- gathering and synthesis of evidence and
- application of that evidence into clinical practice

Task

Questions:

- What is hypertension?
- What is Chagas disease?
- What is the role of a single dose versus short course of Primaquin in management of Plasmodium falciparum transmission?

Task:

Search and get the answer.

Where to search: you decide……

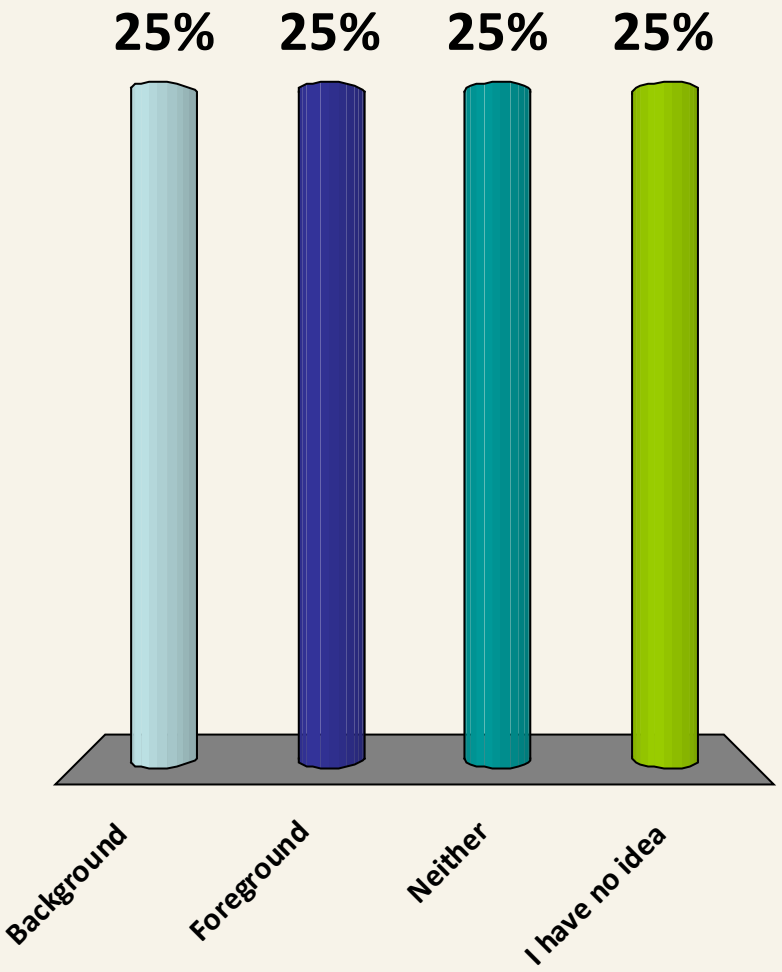
What is hypertension?
Which type of question is this?

A. Background

B. Foreground

C. Neither

D. I have no idea



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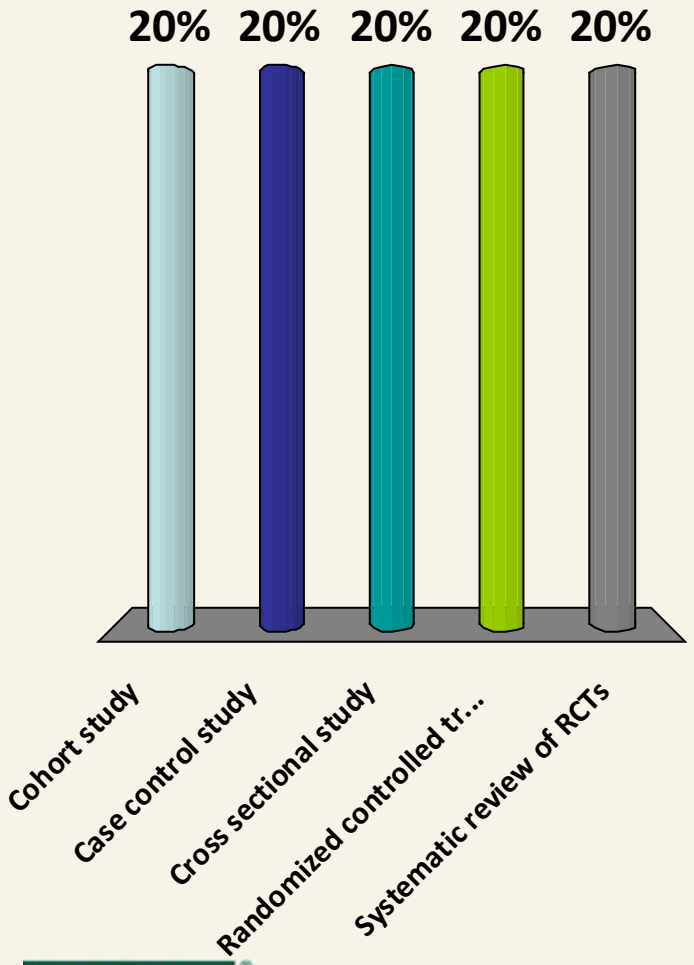
Whether a single dose or short course of Primaquin added to treatments for malaria caused by Plasmodium falciparum infection reduces malaria transmission

What is an ideal study design to answer this question?

A. Cohort study
B. Case control study
C. Cross sectional study
D. Randomized controlled trial (RCT)
E. Systematic review of RCTs



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Resources

- A resource's usefulness is contingent on many factors such as:
  - Type of question
  - Availability of resources
  - Stage of your training
  - Your specialty
  - Your familiarity with the specific topic of a search

Categories of Clinical Information Resources

Category	Description	Degree of Evidence Processing	How Many Exist	Ease of Use
Systems	Textbook-like resources that summarize and integrate clinical evidence with other types of information directed at clinical practice decisions/directions	Substantial processing with the integration of evidence and practice–can direct care (give answers) or provide evidence on a clinical action	Few	Very easy
Synopses	Summaries of studies and systematic reviews that include guides or advice for application by expert clinicians	Evidence is externally assessed, with strengths and weaknesses provided for each article/topic	Several thousand	Easy
Summaries	Systematic review of articles and clinical practice guidelines–you assess the information and make decisions	Systematic reviews and high-quality guidelines summarize and present evidence from primary studies; some exemplary guidelines can also be considered synopses	Fewer than 50,000	Use may be time consuming and access to full text may require some searching
Studies	Individual studies (e.g., MEDLINE articles)	No processing of evidence at all–individuals must assess and apply	In the millions	Requires critical appraisal; hard to find and may require searching databases

Where to search?

Published studies

Shimberg Library

Main library e-journals

Inter library loan service

- **General clinical questions**
  - MEDLINE (PubMed)
    - Pubmed "Apps" and other resources
  - EMBASE
  - CENTRAL (Cochrane library)
  - Web of Science

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Where to search?

Published studies

- **Subject-specific databases**
  - CINHAL, British Nursing Index, AMED
    - Nursing and allied health
  - PsychINFO, ASSIA
    - Social science, education, psychology and psychiatry
  - AgeLine, Childdata, Social Services Abstracts
    - Social and community health and welfare

Where to search?

Published studies

- **Regional databases**
  - LILACS
    - Latin America and the Carribean
  - PASCAL
    - Europe (fee based)
  - IndMED
    - India
  - CBM
    - China (in Chinese)
  - IMSEAR
    - South-East Asia

Where to search?

Ongoing/unpublished trials

- **National and International trial registries**
  - Clinicaltrials.gov
  - WHO International Clinical Trials Registry
  - CenterWatch

- **Industry trial registries**
  - GlaxoSmithKline (all attempted trials)
  - AstraZeneca, Bristol-Myers Squibb, Eli Lilly, Novartis, Roche, Wyeth (selected trials are reported)

Where to search?

Hand-searching

- Conference abstracts
  - ASH,ASCO, APHA,
- Snowball search
  - References from related systematic reviews and literature reviews
  - References in included studies
- Consult with content experts

Using the question to guide the search

- Scenario - You are interested in checking the hearing of elderly patients, and have heard that the ‘whispered voice test’ is good.

- Question
  - Population
  - Indicator (intervention, test, etc)
  - Comparator
  - Outcome

PICO(TS)

- **Question in a structured format**
  - Population – in elderly patients does
  - Indicator – a ‘poor’ whispered voice test
  - Comparator – a ‘normal’ whispered voice test
  - Outcome – predict abnormal audiogram
  - Type - diagnostic accuracy
  - Study design- cross sectional
- Pubmed

Case

- Lumbar supports (also called braces or corsets) are commonly used in the prevention and treatment of low-back pain.
- Is lumbar support useful in the management of lower back pain?
- How would you search for evidence to support your judgment / decision regarding buying a lumbar support brace?
  - Amazon?
  - Google?
  - Pinterest?
  - Facebook?

Truncation

- Most databases allow use of a symbol to assist in retrieving different endings for words

- Pathology in a search retrieves just that
- pathol* retrieves the root with any ending, i.e., pathology, pathological, pathologist, etc.

- * is the most common truncat* symbol

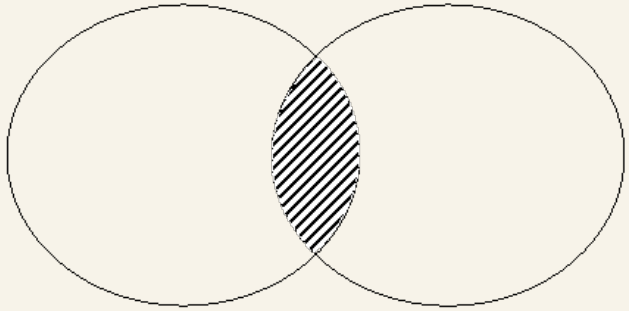
Boolean

Mathematical operators represented by words

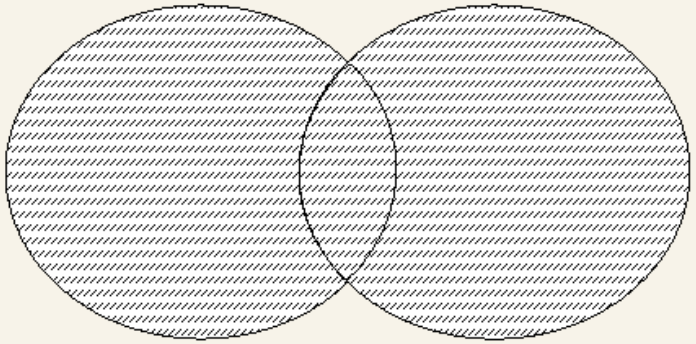
- OR=addition; using “OR” ⇧ results
- AND=intersect/union; using “AND” ⇩ results
- NOT=subtraction; using “NOT” also ⇩ results

- Math symbols (+,-) do not work;
- use OR AND NOT; and capitalized

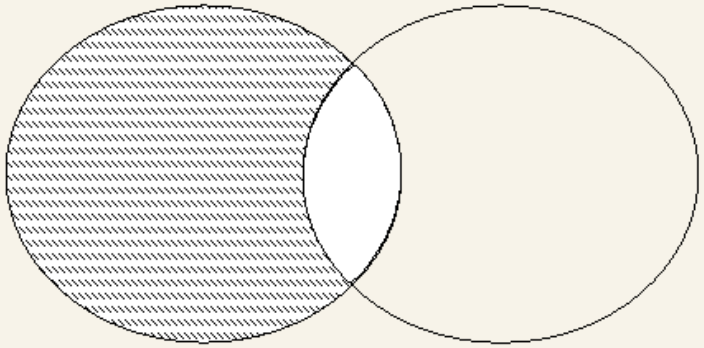
"AIDS" AND "Tuberculosis"



"Penicillin" OR "Cipro"



"AIDS" NOT "Sarcoma"



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PubMed

- Where we search for research from medical journals
- 13 million citations/abstracts
- 4,500 journals
  - From 1966

- Covers
  - Medicine
  - Nursing
  - Dentistry
  - Veterinary medicine
  - Healtchcare systems
  - Preclinical sciences

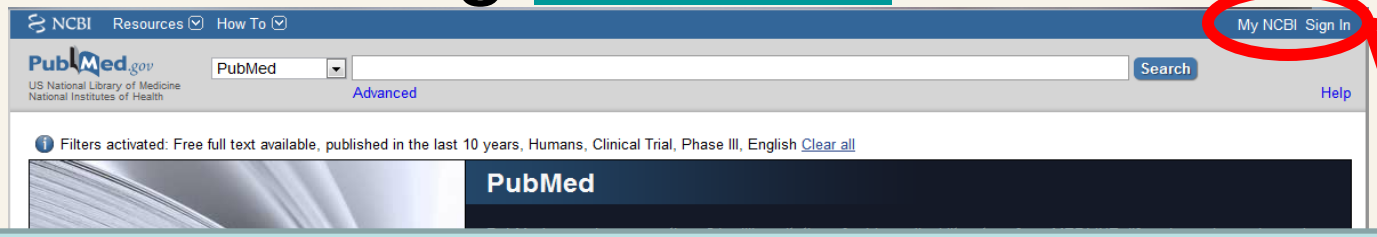
More About PubMed

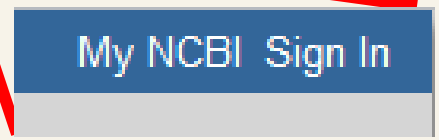
- Links to other databases
  - OLDMEDLINE (1950-1965)
  - International biomedical journals
    - 1,760,000 citations
- Not all journals are strictly scientific or medical
  - We recently found a Newsweek article in PubMed
- Links (LinkOut) to the full-text of articles at participating publishers' web sites

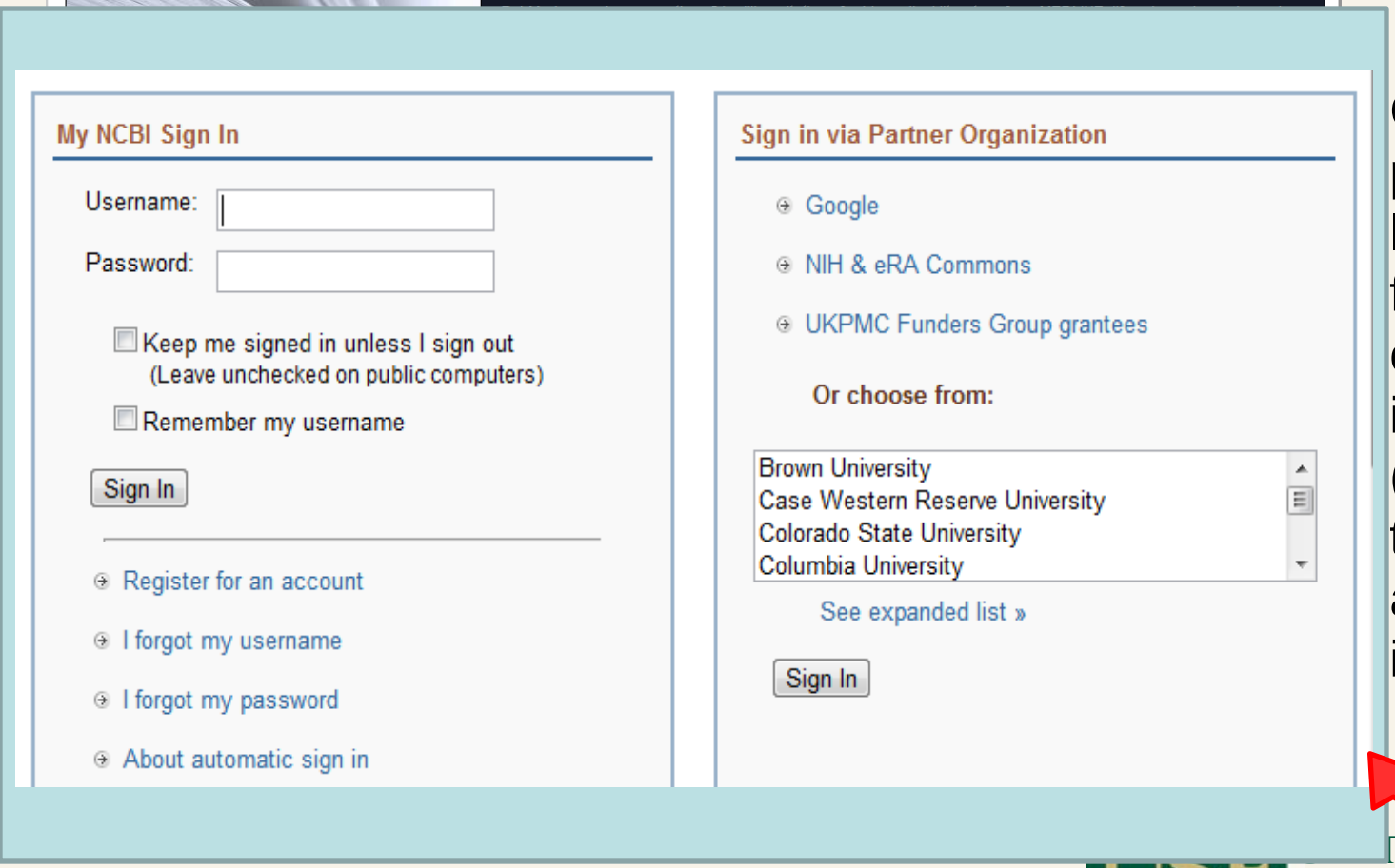
What Can You Do in PubMed?

- Search for articles (usually abstracts)
  - By keyword
  - By author
  - By Journal, etc
- Combine searches
- Link to related articles
- Link to outside sources
  - To purchase the full article
  - Look at related books (including pages in the books)
- Clinical queries

Searching PubMed

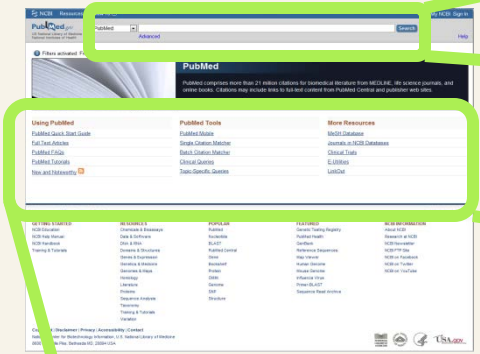


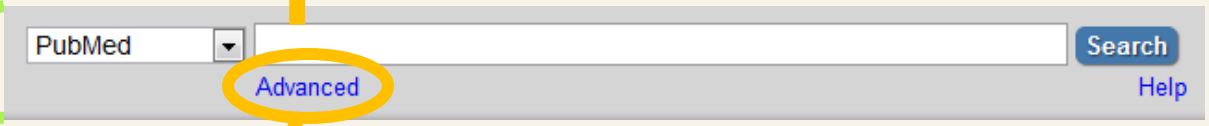




Can sign in using personal login for limited access to full text articles or using your institutional login (USF) for access to articles available to your institution

Searching PubMed

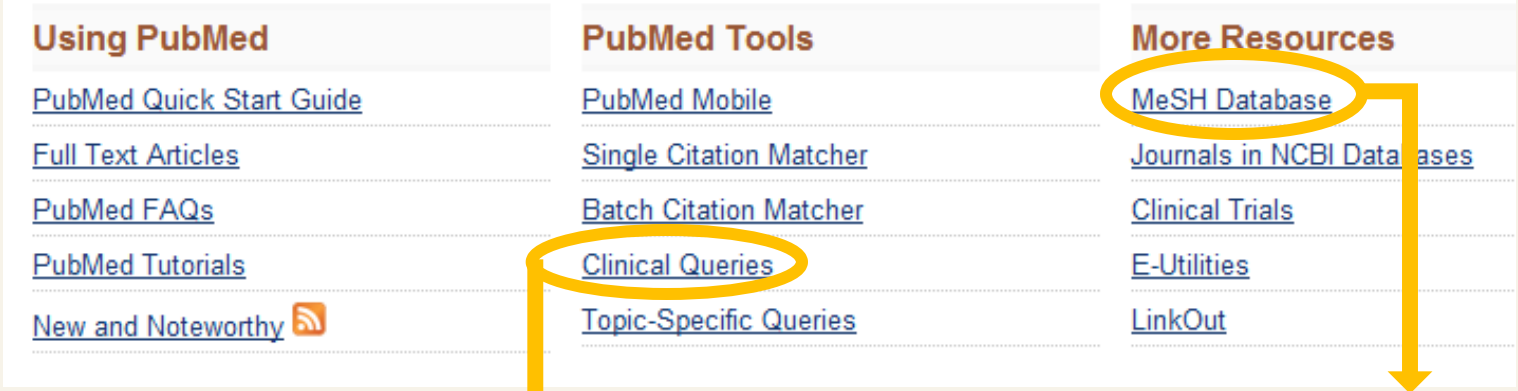




Comprehensive PubMed search

Advanced search builder:

Allows you to combine previous searches



Clinical Queries:

- Limits search to specific clinical research areas
- Use to search for systematic reviews

MeSH Database:

- Use to search for MeSH terms to include in search strategy

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Using PubMed Clinical Queries

PubMed Clinical Queries

Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use PubMed directly.

Bisphosphonates for Multiple Myeloma Search

Clinical Study Categories

Category: Therapy

Scope: Broad

Results: 5 of 803

Bisphosphonates in multiple myeloma: a network meta-analysis.

Mhaskar R, Redzepovic J, Wheatley K, Clark OA, Miladinovic B, Glasmacher A, Kumar A, Djulbegovic B.

Cochrane Database Syst Rev. 2012 May 16; 5:CD003188. Epub 2012 May 16.

Effects of induction and maintenance plus long-term bisphosphonates on bone disease in patients with multiple myeloma: the Medical Research Council Myeloma IX Trial.

Morgan GJ, Davies FE, Gregory WM, Szubert AJ, Bell SE, Drayson MT, Owen RG, Ashcroft AJ, Jackson GH, Child JA, et al.

Blood. 2012 Jun 7; 119(23):5374-5383. Epub 2012 Apr 12.

[The affection of bisphosphonates combined

Systematic Reviews

Results: 5 of 32

Bisphosphonates in multiple myeloma: a network meta-analysis.

Mhaskar R, Redzepovic J, Wheatley K, Clark OA, Miladinovic B, Glasmacher A, Kumar A, Djulbegovic B.

Cochrane Database Syst Rev. 2012 May 16; 5:CD003188. Epub 2012 May 16.

Bisphosphonates in lung cancer: can they provide benefits beyond prevention of skeletal morbidity?

Hirsh V.

Anticancer Agents Med Chem. 2012 Feb; 12(2):137-43.

Bisphosphonate anticancer activity in prostate cancer and other genitourinary cancers.

Saad F, Mulders P.

Medical Genetics

Topic: All

Results: 5 of 30

A gene expression-based predictor for myeloma patients at high risk of developing bone disease on bisphosphonate treatment.

Wu P, Walker BA, Brewer D, Gregory WM, Ashcroft J, Ross FM, Jackson GH, Child AJ, Davies FE, Morgan GJ.

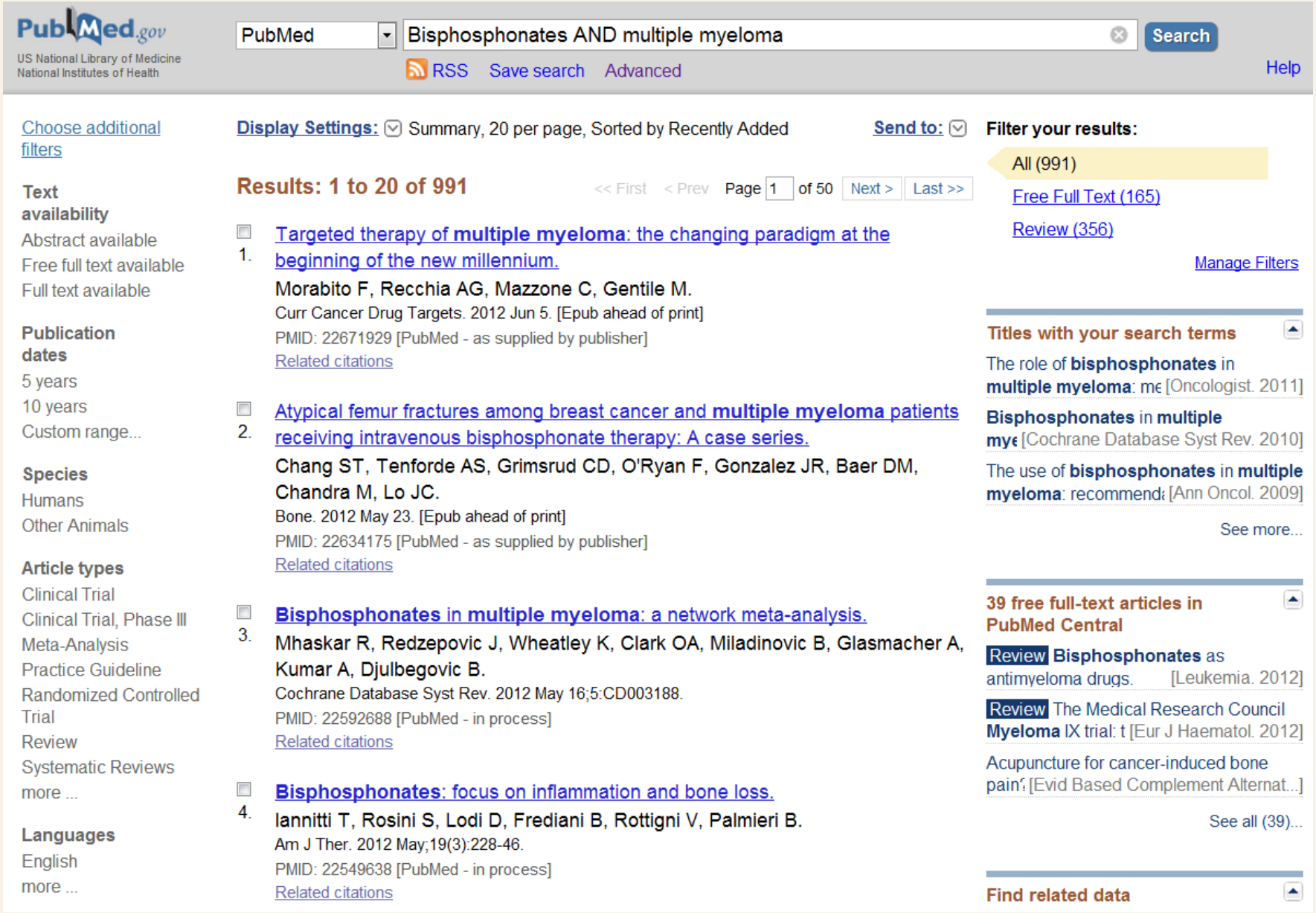
Clin Cancer Res. 2011 Oct 1; 17(19):6347-55. Epub 2011 Aug 19.

Immune modulation by zoledronic acid in human myeloma: an advantageous cross-talk between Vγ9Vδ2 T cells, αβ CD8+ T cells, regulatory T cells, and dendritic cells.

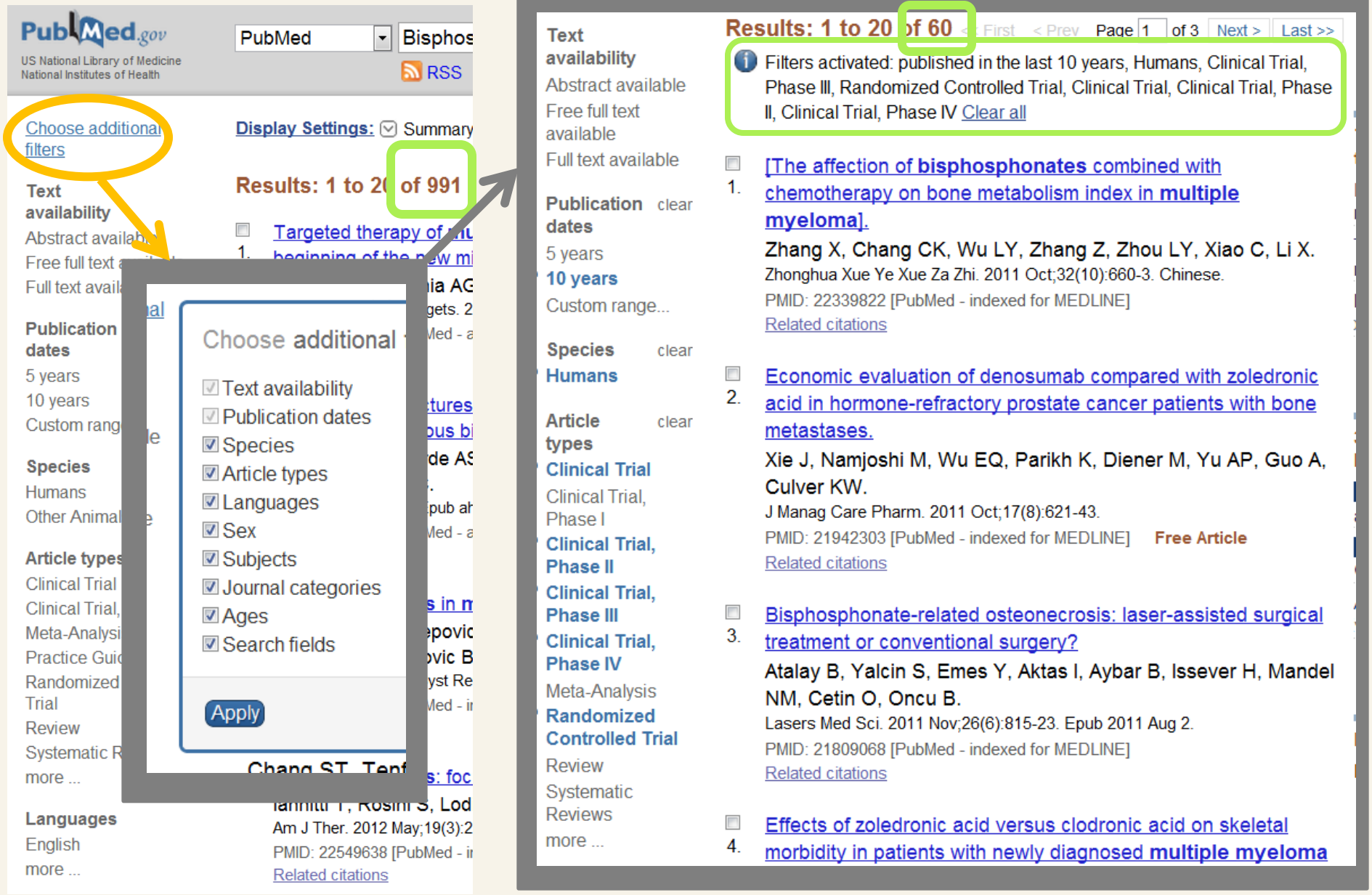
Castella B, Riganti C, Fiore F, Pantaleoni F, Canepari ME, Peola S, Foglietta M, Palumbo A, Bosia A, Coscia M, et al.

J Immunol. 2011 Aug 15; 187(4):1578-90. Epub 2011 Jul 13.

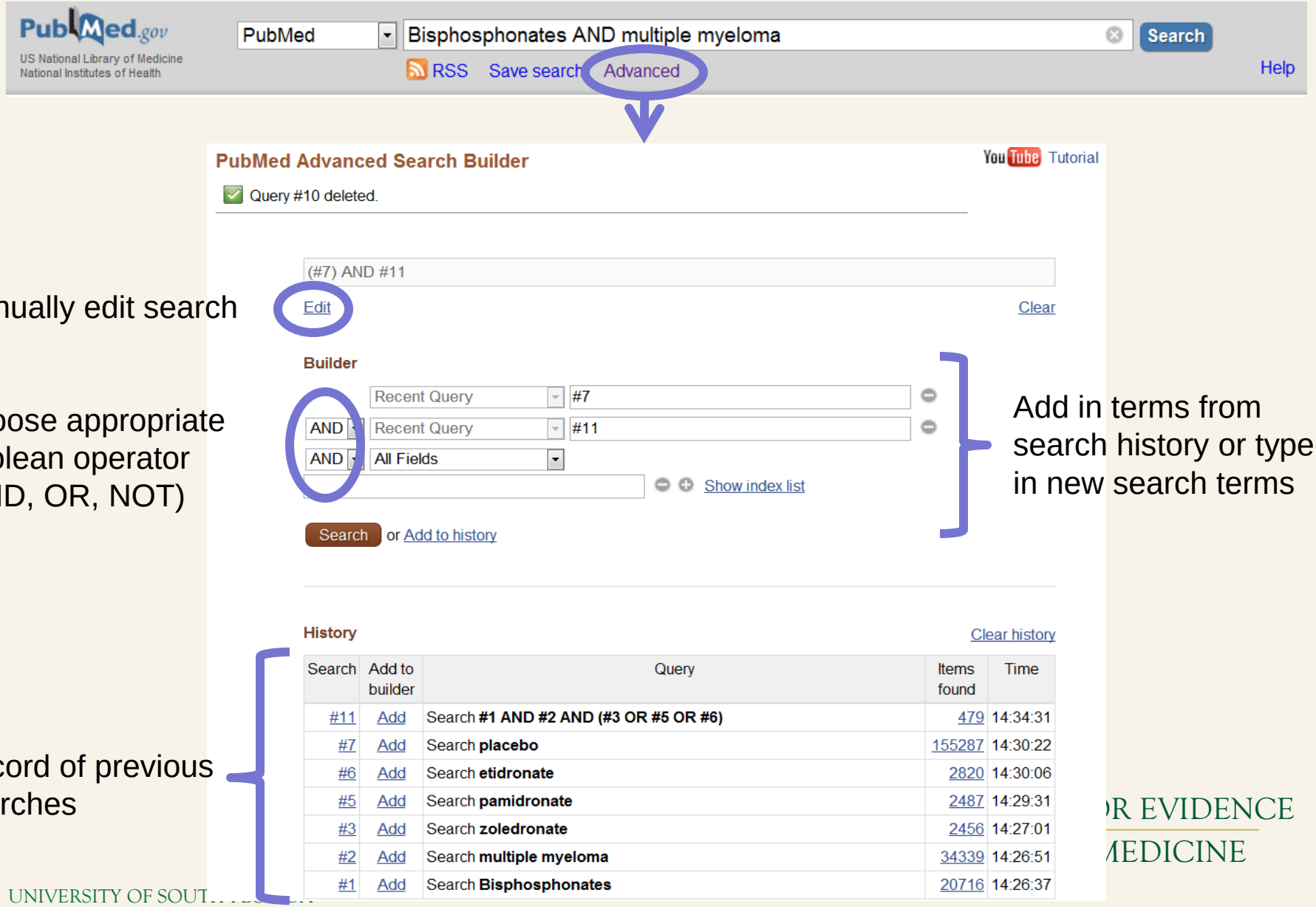
General search in PubMed



Setting search filters in PubMed



Advanced search in PubMed



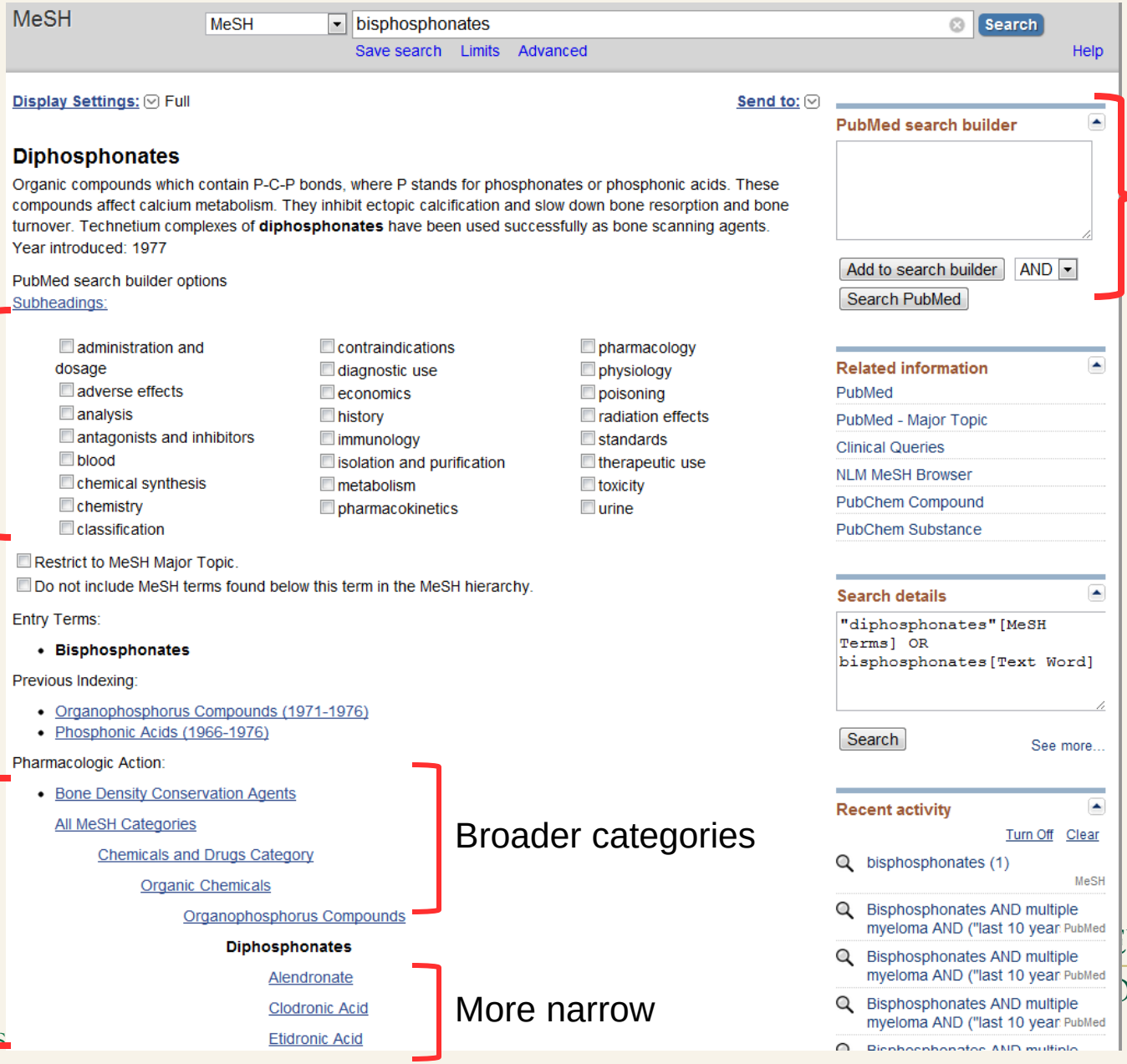
Manually edit search

Choose appropriate Boolean operator (AND, OR, NOT)

Add in terms from search history or type in new search terms

Record of previous searches

Using Medical Subject Headings (MeSH)



Select subheadings and terms to add to the search builder

Subheadings
>80 possible groupings used

Broader categories

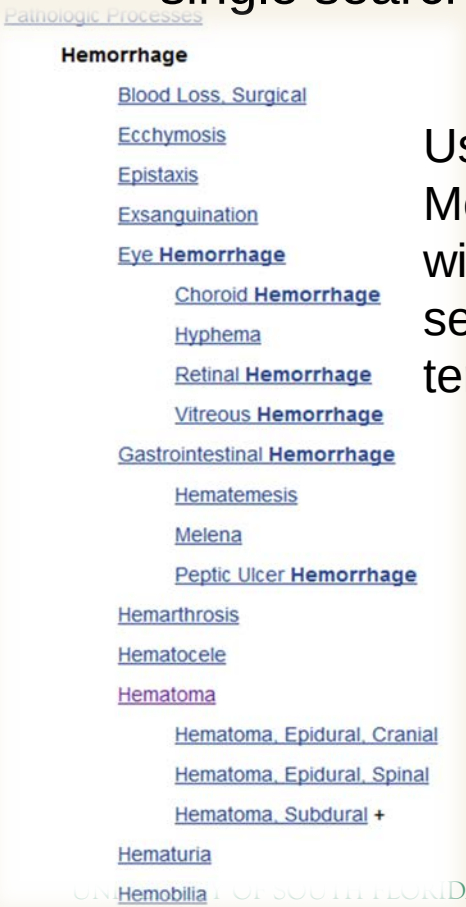
MeSH categories

More narrow

Building a search with MeSH terms

Pros

- Allows you to search for multiple related terms using single search



Using a broad MeSH category will allow you to search all the terms below it

Cons

- MeSH terms are assigned to studies by humans
  - Assignment may be subjective and may not include all studies in the category
- MeSH terms are assigned after the study is indexed
  - May not identify recently published studies

Use a combination of text and MeSH terms

PICO search

Medline allows you to search using the

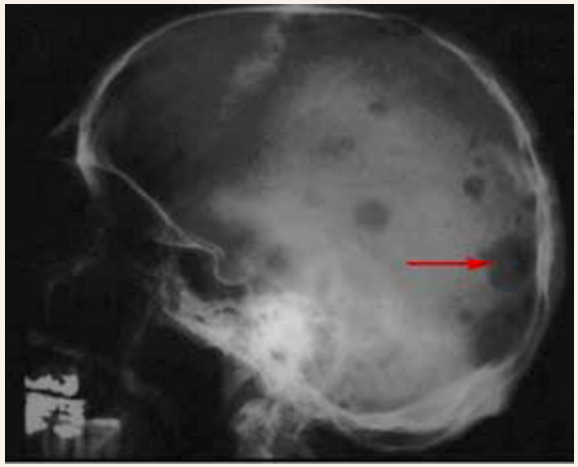
- Patients
- Intervention
- Control
- Outcomes
- Publication type (trial/systematic review etc.)

PICO search

(http://pubmedhh.nlm.nih.gov/nlmd/pico/piconew.php)

Image search

Google images



Trip database

- a clinical search engine designed to allow users to quickly and easily find and use high-quality research evidence; has been online since 1997.
- motto is 'Find evidence fast'.
- can search across other content types including images, videos, patient information leaflets, educational courses and news.

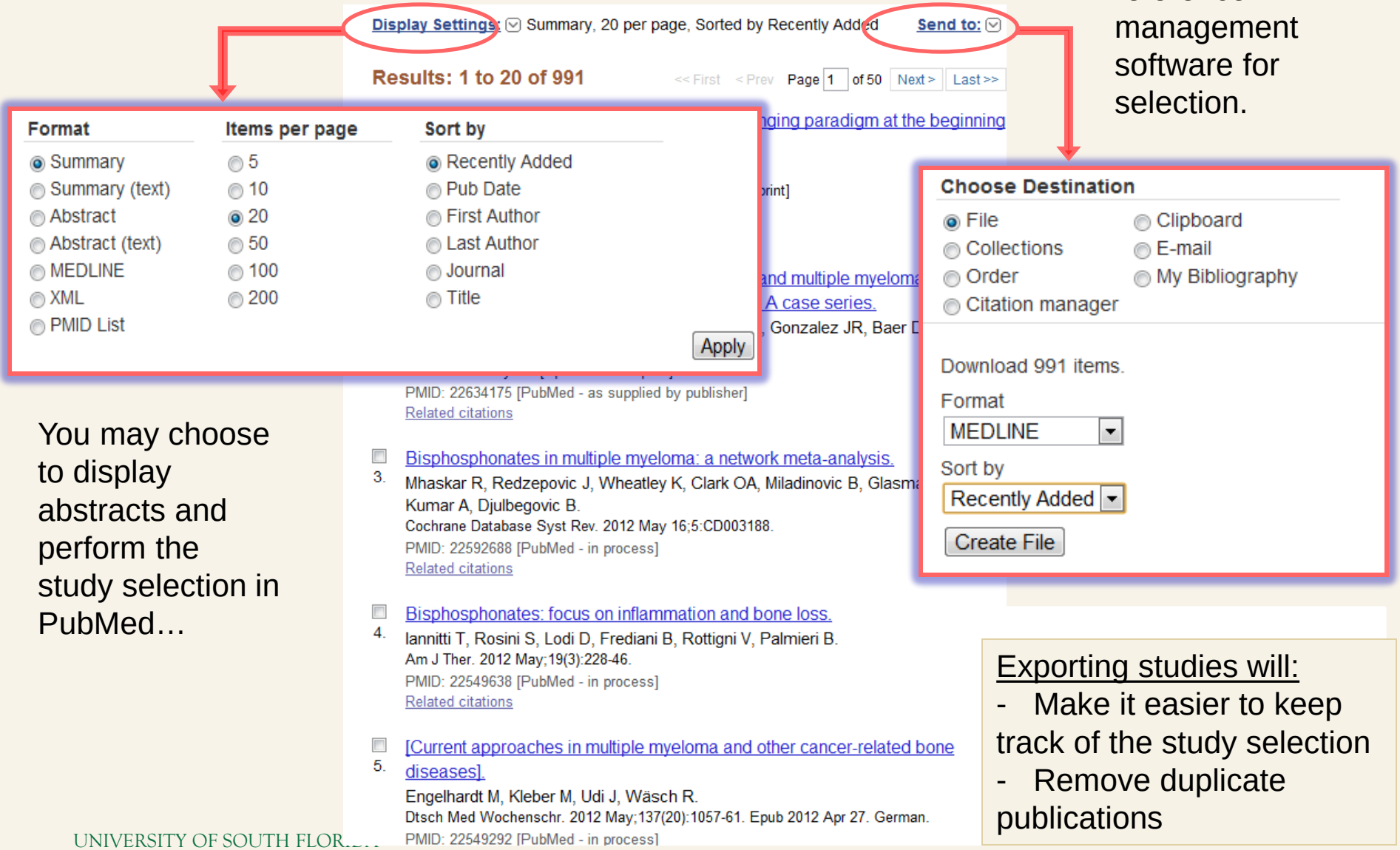
- The content from PubMed is typically added every two weeks
- while content added manually (secondary evidence) is added once per month (middle of the month).

Tips for building a good search strategy

- Use MeSH terms
  - Form ‘backbone’
- Add free text
  - Identify recently added/un-indexed studies
- Use appropriate filters
  - To obtain manageable number of studies manual selection
- Pilot test strategy

Managing search results

… or export studies to a reference management software for selection.



You may choose to display abstracts and perform the study selection in PubMed…

Exporting studies will:

- Make it easier to keep track of the study selection
- Remove duplicate publications

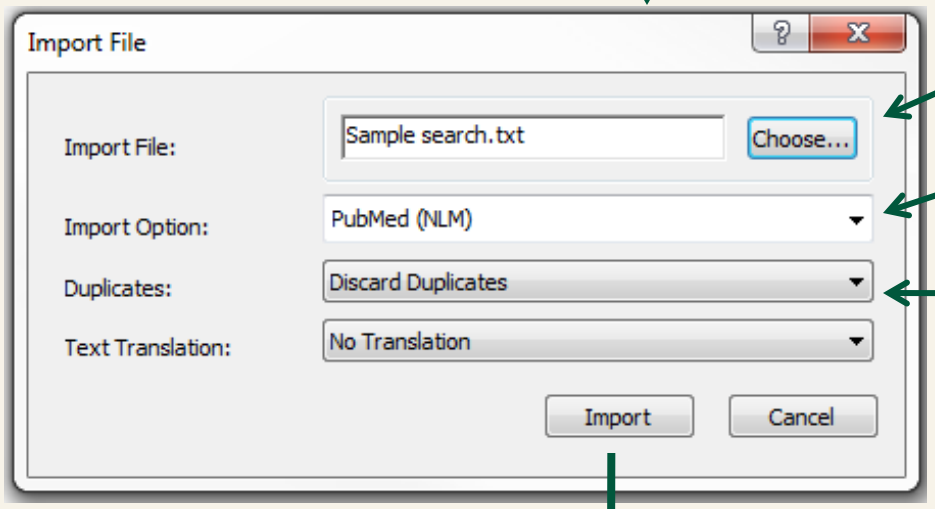
Managing search results:

Working with EndNote

- Create new EndNote library

  (File:New => [enter library name] => Save)

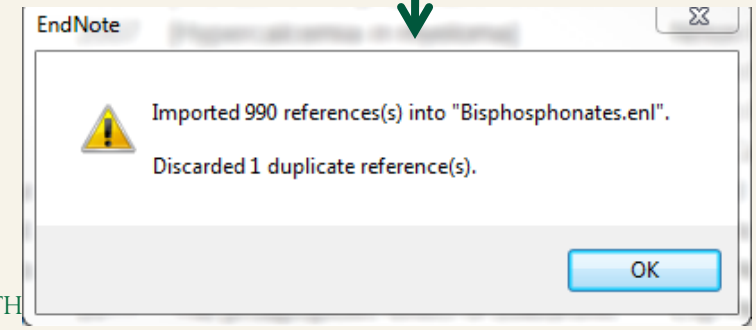
- Import results
  - (File:Import:File



Select the file exported from searched database

Select database used to search for studies (PubMed, Cochrane…)

If compiling results from multiple searches, this option will automatically remove all duplicate references



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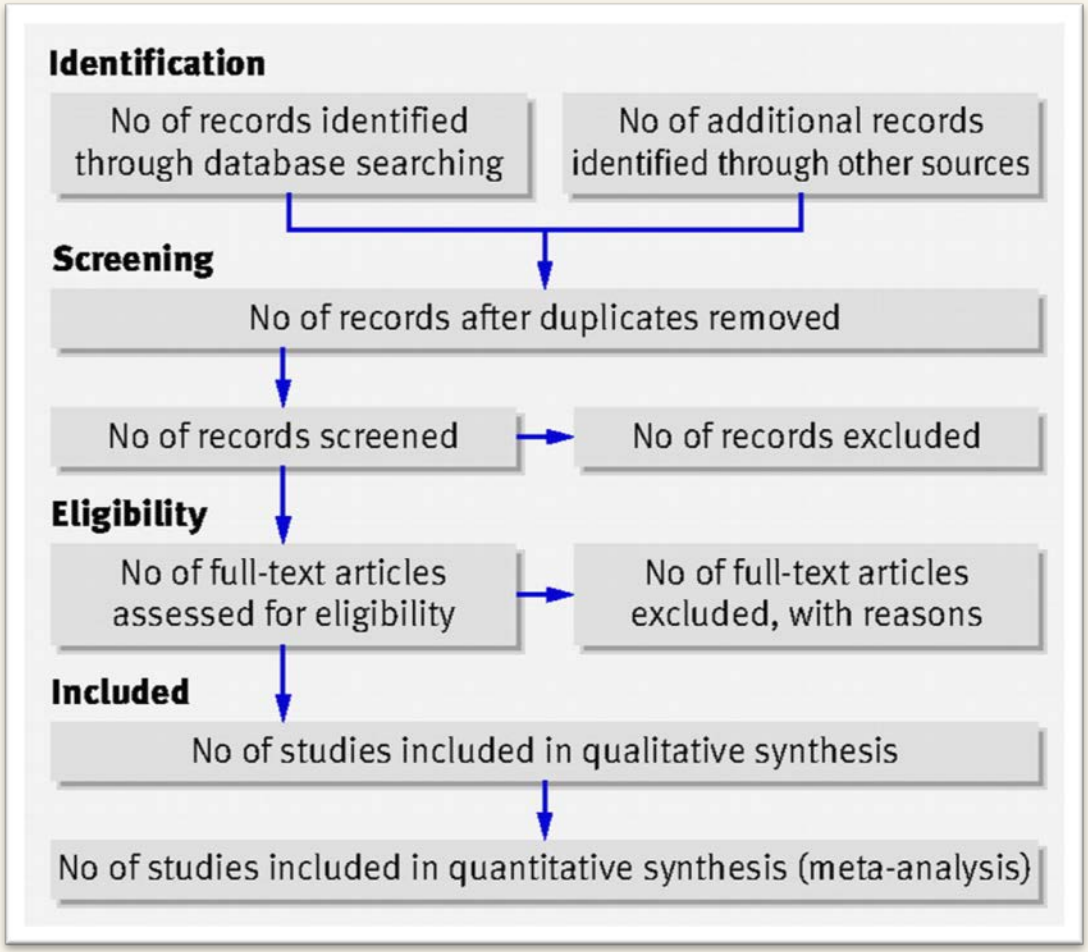
PRISMA diagram



FDA Webpage – Tons of Info.

- Contains MedWatch
  - product safety alerts
    - Alerts be sent to your email address as they happen
- Find
  - Warning Letters
    - http://www.fda.gov/foi/warning.htm
  - Approved drugs and patent information
    - Using the Electronic Orange Book database
    - http://www.fda.gov/cder/ob/default.htm
  - Devices
    - http://www.fda.gov/cdrh/index.html
  - Guidance documents
    - http://www.fda.gov/cder/guidance/guidance.htm

Categorization of Information Resources Readily Available

Category/ Examples of category	Soundness of Evidence-Based Approach	Comprehensiveness	Ease of Use and Availability
Textbook-like Resources (Systems)			
Up to Date	Moderate	Most clinical areas, especially internal medicine and primary care	Easy to use, although searching somewhat lacking; $450 for individuals for their first year, then $350 per year; $10,000 plus for libraries
DynaMed	Strong	More than 2,000 summaries presented in standard formats for primary-care physicians	Easy to use; $200 but free if you help in the development
Pre-appraised (Synopses)			
InfoPOEMs	Strong	Recently published family medicine studies; covers all categories of studies	Easy to use; $250
DARE (Database of Abstracts of Reviews of Effects) York, UK	Strong	Covers all disciplines; concentrates on therapy and prevention; summaries of systematic reviews of studies of diagnostic test performance may also be found	Easy to use; free

Categorization of Information Resources Readily Available

Category	Comprehensiveness	Ease of Use/Availability
Systematic Reviews and Guidelines (Syntheses)		
US National Guide-lines Clearinghouse	Comprehensive coverage of US and many other nations' guidelines; often several guidelines on the same topic	Easy to search; one of the strengths of the site is being able to "compare" guidelines on the same topic; free
Cochrane Database of Systematic Reviews	Covers broad range of disciplines; limited to therapy and prevention	Easy to find a Cochrane review but sometimes difficult to apply because of the depth of cover-age; abstracts free; included in many composite resources such as Ovid
Primary Studies		
MEDLINE	Lots of primary studies across all disciplines and areas of research	Hard to find a specific study and often difficult to use; free
Cochrane Controlled Trials Registry (CCTR)	All specialties and all topics for which a controlled trial is relevant (therapy and prevention mainly)	The Cochrane Library includes DARE, Cochrane systematic reviews, and CCTR; the fastest way to determine whether a controlled trial has been published on the topic
PubMed Clinical Queries	Limits searches to those articles with some possibility of having direct clinical application	Easier to use than MEDLINE because the queries turn MED-LINE into a clinical tool; free

Categorization of Information Resources Readily Available

Category	Comprehensiveness	Ease of Use/Availability
	Others	
Google	One of the major search engines to the Web–almost everything	Easy to find something, hard to find just what you want and to know the worth and evidence behind the content; fastest way to find high-impact articles that have recently made press and media headlines
TRIP	A single search system for 150 health databases; one-stop searching; comprehensive; also has 27 specialist subsections (allergy to urology)	Easy to use; free access

Selection Criteria for choosing or Evaluating Resources

Criterion	Description of Criterion
Soundness of evidence-based approach	How strong is the commitment to evidence to support inference?
	How well does the resource indicate the strength of the evidence behind the recommendations or other content?
	Does the resource provide links for those who wish to view the evidence?
Comprehensiveness and specificity	Does the resource cover my discipline or content area adequately?
	Does it cover questions of the type I am asking (e.g., therapy, diagnosis, prognosis, harm)?
	Does it target my specific area of practice?
Ease of use	Does it give me the kind of information I need quickly and consistently?
Availability	Is it readily available in all locations in which I would use it?
	Can I easily afford it?

Case 1

- A 65 year old female comes to your clinic and is suffering from chemotherapy induced anemia and is being treated with erythropoietin stimulating agent (ESA). She is wondering if an iron supplement in addition to the current ESA will help her anemia get any better?

- Search for evidence to assist you in decision-making !!

Case 2

- A 60 year old man with multiple myeloma is referred to a cancer center for the management of his bone disease.
- Bisphosphonates are used to manage osteoporosis. The attending physician wants to decide whether the patient should be treated with bisphosphonates?

- Search for evidence to assist you in decision-making !!

Questions / comments

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