Accessing the Biomedical Literature for the Best Evidence

- Structuring the search for information and evidence
- Basic search resources
- Starting the search

Lab / Practice:
- Simple searches
- Using PubMed and EBSCOhost features to enhance search for evidence
Accessing the biomedical literature through a structured search and understanding available resources
Accessing the biomedical literature through a structured search

- The best way to learn to search for high quality, authoritative, relevant and current evidence is to actually click around a website or database.
- Explore and use the features that will benefit you the most.
Accessing the biomedical literature through a structured search

- Review basic database features here
- Use the tutorials linked at the end to update skills
- Try the Guided Search Practice
- Then, using your favorite database (or any of those listed in the LRC), click here for LRC databases - try searching using PICO components and database features!
Where to look for answers
What are we looking for?
What are we looking for?

High quality
Authoritative
Peer-reviewed
Relevant
Valid
Accessible
Applicable
Evidence
What are we looking for? Where do we start?

- Identify the type of information and evidence that will best answer your question
- Ask: has someone else already answered this question?
What are we looking for? Where do we start?

- Identify sources of authoritative, reliable, accessible secondary literature

- Systems
  - Evidence-based Systems Literature
    - Systematic Reviews (SR), Meta-Analysis
    - Best Evidence Guidelines + Evidence Summaries
    - Randomized, controlled trials (RCT)
    - Clinical trials, Cohort Studies
    - Case Control Case series
    - Case study / case report
    - Animal studies, in vitro studies
    - Expert opinions, editorials

- Synopses
- Syntheses
- Studies

Strauss 2005; Virgellio 2007; CEBM 2008
Systems

- Compiled evidence websites
- Evidence-based reference resources

Natural Standard

MedlinePlus

NATURAL MEDICINES

COMPREHENSIVE DATABASE

United States Department of Health & Human Services

Agency for Healthcare Research and Quality

Advancing Excellence in Health Care

strauss 2005
Synopses

➢ Short evidence-based summaries of original (primary) research
➢ Linked to the original literature
Syntheses / Systematic Reviews

- Use explicit, rigorous methodical evaluation & summary
- Strict scientific design of search, consideration, appraisal and summary
- Systematic review: no statistical combination
- Meta-analysis: statistical combination and comparison

Cochrane Database of Systematic Reviews
Studies

- Primary literature
- Original research performed by the authors of the article

- Study type: particular type of question
  - therapy, prognosis, diagnosis, prevalence, economic & policy

- Study design: built to answer a particular type of question
  - Systematic review, meta-analysis, clinical trial, cohort study, case series, case report, etc.
Hierarchy of Evidence

- Evidence-based Systems Literature
- Systematic Reviews (SR), Meta-Analysis
- Best Evidence / Evidence Guidelines + Evidence Summaries
- Randomized, controlled trials (RCT)
- Clinical trials, Cohort Studies
- Case Control Case series
- Case study / case report
- Animal studies, in vitro studies
- Expert opinions, editorials
Identify the type of information or evidence most likely to answer your type of question.

- Has someone else already answered this question?
- Search **secondary** (synthesized, summarized)
  - Can you trust the quality filtering process of these sources?
- Do you have to go to **primary** (original) sources in bibliographic databases to find evidence?
Start: Your Search Engines

- computer programs that electronically search the contents of **text-oriented** databases to locate specific information based on key text words
- find different types of **information**

- Text word search of text files, some database text, data
- Returns pages that include **all search terms**
  - Automatic “AND”
  - Broaden or restrict by including more or fewer terms
  - Supports Boolean operator “OR”
  - Exact match use “quotation marks”
  - Exclude terms using “-” with space before term
- No stemming, truncation or wildcard (wild*)
- Needs correct spelling (suggests correct spelling)
- Not restricted, filtered or quality controlled
Google Advanced Search http://www.google.com
Search: recent CAM resources in English, PDF format, with some connection to the National Library of Medicine

Find results
with all of the words
with the exact phrase
with at least one of the words
without the words
chiropractic
national library of medicine

Language
Return pages written in
English

File Format
Only return results of the file format
Adobe Acrobat PDF (.pdf)

Date
Return web pages updated in the
past year

Numeric Range
Return web pages containing numbers between
and

Occurrences
Return results where my terms occur
anywhere in the page

Domain
Only return results from the site or domain
e.g. google.com, .org

SafeSearch
No filtering Filter using SafeSearch

Froogle Product Search (BETA)
Products
Find products for sale

To browse for products, start at the Froogle home page
Search engines: Google Scholar
http://scholar.google.com/

- Quality controlled and managed:
  - scholarly literature: peer-reviewed papers, theses, books, abstracts, articles,
  - academic publishers, professional societies, universities, scholarly organizations

- Advanced search: limits (dates), filters, qualifiers

★ Add the NUHS library access links (up to three libraries):

- Scholar preferences >> library links >> choose NUHS when on campus
- >> may need LRC password list when off campus
Search engines and the internet lead us to …

**website**
- set of interconnected webpages *(electronic text files)*
- collection of information

**database**
- collection of records, or pieces of *knowledge (data)*
- connected through structured relationships

**database management system** *(DBMS)*
- manage and query a database using *data fields*
Compiled Evidence Websites & Databases

NUHS LRC database web page
http://www.naturalstandard.com/

NUHS LRC database web page
http://www.naturalmedicines.com/member_home.asp/

Agency for Healthcare Research and Quality
http://www.ahrq.gov/

US Nat’l Library of Medicine / National Institutes of Health
http://www.nlm.nih.gov/medlineplus
Biomedical Literature Databases

Entrez PubMed

EbscoHost:  http://search.epnet.com/
Off campus Login:  User ID:  s9817535  Password:  password

- **text-based** search and retrieval system used at the National Center for Biological Information (NCBI) at the National Library of Medicine
- Access to biomedical databases: PubMed, MEDLINE, MedlinePlus, PubMed Central (free text)
- Provides access and links to the other NLM resources: molecular biology resources, Nucleotide and Protein Sequences, Protein Structures, Complete Genomes, Taxonomy, OMIM, and many other databases

- U.S. National Library of Medicine's (NLM®) database of biomedical citations and abstracts
- access to +17 Million citations from biomedical literature
- links to full text, resources, publishers, journals
MEDLINE

- the largest component of PubMed
- indexed, peer-reviewed, “quality controlled” standards
  - Not all PubMed citations are indexed in MEDLINE
  - JMPT is the only chiropractic journal indexed in MEDLINE.
  - Chiropractic and Osteopathy can be found when searching in PubMed, but is not indexed in MEDLINE
- covers over 5000 journals published in the United States and more than 80 countries
  - primarily from 1950 to the present
- references to articles indexed with terms from NLM’s controlled vocabulary, MeSH®
How do I search PubMed?


- To get started, enter one or more search terms.
- Search terms may be topics, authors or journals.

Set up an automated PubMed update in fewer than 5 minutes.

(1) Get a My NCBI account.
(2) Save your search.
(3) Your PubMed updates can be e-mailed directly to you.

Read the My NCBI Help material to explore other options, such as automated updates of other databases, setting search filters, and highlighting search terms.
How do I search PubMed?

1. Identify the key concepts for your search. Use PICO components.
2. Enter the terms (or key concepts) in the search box.
3. Click Go.
How do I search PubMed?

4. Results will display in **Summary** format if multiple citations are found.

5. Results may display in **Abstract Plus** if there are few (one).

6. Feature Tabs: Limit, filter, broaden or narrow, combine searches after saving...
Journals Database allows you to search for journals.

MeSH Database allows you to browse the Medical Subject Headings (MeSH) controlled vocabulary.

Single Citation Matcher helps you find citations by Journal info, author, title key words, etc.
The **MeSH Database** is available from the Search pull-down menu or the sidebar.

- Use the MeSH database to find MeSH terms including Subheadings, Publication Types, Supplementary Concept Records (substance names) and Pharmacological Actions - and build a **PubMed search strategy**.

- The MeSH database can be searched by MeSH term, MeSH Entry Term, Subheading, Publication Type, Substance Name, or words within a MeSH Scope Note.

- Subheadings and Publication Types are included in the MeSH term searches.
Advantages of MeSH terms and searching by MeSH terms

- MeSH retrieves records where search topic is not in title or abstract
- Retrives articles where search term (MeSH) is a key part of the article
- Represent a particular concept
- Gathers concepts into sets
- Can be used to broaden, narrow and “link” related concepts, terms and studies
Disadvantages of MeSH terms and searching by MeSH terms

- Indexing inconsistency can be a problem (not often due to quality control measures)
- Not all concepts are represented by MeSH
  - Specific technical terms, jargon
Search Strategies in PubMed – Pre-set Special Queries

- **Clinical Queries** built-in search "filters" designed for clinicians including clinical study category narrow or broad filters
  

- **Special Queries** pre-built topic specific queries with filters for clinical research and applications
Search Strategies in PubMed – Automatic searches

My NCBI:
- customize NCBI web services
- Register; browser must accept cookies
- save search strategies
- select & set filters
- receive automatic e-mail updates
- save citations collections
- group retrieval by topics

Set this up! Great benefit!
Search Strategies in PubMed

Related articles

- Retrieves a pre-calculated set of citations that are similar to the original citation
- Easy to use
- Lists most relevant first
Search Strategies in PubMed

**LinkOut**

- links to relevant web-accessible online resources including full-text publications.
- links to information and services beyond the Entrez system
- may include links to biological databases, consumer health information, research tools, etc.
- no additional searching necessary to access the relevant resource linked to the record.
- Subscription-based tool (DBMS and meta-database)
- Access and search capability of a large variety of databases, including CAM databases and literature
- **Free** to students on and off campus
  - Password needed to access from off campus
- Create a My EBSCOhost account: Set this up!
  - Save searches
  - E-mail alerts when related articles are added to selected databases

Great benefit!
EbscoHost on campus link:
(NUHS home > Student Services > LRC > databases > Via EbscoHost login
http://search.epnet.com/)

EbscoHost off campus:  http://search.epnet.com/
Use NUHS LRC Passwords document
Login Info:  User ID:  s9817535  Password:  password
Select Multiple databases or one per search

one database per search: use of controlled vocab & benefits
Search Strategies

Search Operators or Boolean Operators

- AND, OR, NOT (must be ALL CAPS)

- Use search operators to maximize efficiency:
  - **AND** requires that both words be included in search
    - Chiropractic AND Headaches will only return articles with both.
    - This is a default function on many programs and usually can be skipped
    - Use the ++ sign before the second word
  - **OR** explodes and broadens a search with a different PICO component
  - **NOT** excludes the word or subject immediately following
    - spondylosis NOT thoracic would yield lumbar and cervical and omit thoracic
    - Use the –– sign before the second word
Search Strategies

- Use Features Tabs (PubMed)
- Use “Link” features (EBSCOhost)
- Use Limits to specify PICO components
- Use MeSH to include subheadings (PubMed)
- Use Subject Headings (EBSCOhost)
  - One database selection / search for ease
- Check related articles
- Check key words in full citation views
Search Strategies

- Play with searches & results
- Save productive searches
- Access history and combine saved searches
- Automatically run searches
  - Auto e-mail search results
  - Use RSS feed feature
  - Updates search results without re-doing search!
  - (Delete and stop at any time)

Use these features!
Easy and efficient!
Access to Full Text

- The NUHS library subscribes to over 300 journals, many with **full text online access**.

- Use LRC Passwords list from PubMed links

- Go directly to publisher websites with LRC passwords

- EBSCOhost includes HTML and PDF file links for many subscriptions

- **A-to-Z** is an online database providing partial and full access to thousands of journals (on and off campus).
EBSCO A to Z access:
http://atoz.ebsco.com/home.asp?Id=NATIEB8F

- Provides electronic access and electronic full text to almost 10,000 journals
- Provides users with a single, comprehensive online list and access with a single access log-in and IP address recognition.
- Search for journals by keyword, citation data or browse an alphabetical list by title or subject.
- On campus IP address recognition
- Off-campus access log-in:
  User ID: **s9817535**; Password: **password**
- Access through CygNET e-LRC (you must register for this “course”) or LRC database page
Access to Full Text – Interlibrary Loan Form (ILL)

- Last but not least: Interlibrary Loan form (internet submit, e-mail or fax)
- [http://www.nuhs.edu/student_services/AILoanRequestForm.aspx](http://www.nuhs.edu/student_services/AILoanRequestForm.aspx)
  - NUHS >> About Us >> Learning Resource Center >> Services and Features >> Reference and Interlibrary Loan Services >> link to Interlibrary Loan (ILL) form to request full text
Access to Full Text – Interlibrary Loan Form (ILL)

- No charge for EBP courses
- Write in course
- Note electronic copy if possible
- Check copyright info
- Submit electronically
- Fast!
Tutorials to try – Link to PubMed and EBSCOhost

- **PubMed Getting Started:**

- **PubMed Search Tutorial:**

- **PubMed: Advanced Searching with MeSH database**

- **Introduction to EBSCOhost 2.0**
  [http://support.ebscohost.com/training/flash_videos/ehost2/2.0.htm](http://support.ebscohost.com/training/flash_videos/ehost2/2.0.htm)

- **EBSCOhost Advanced Searching and Features**
  [http://support.ebscohost.com/training/flash_videos/advancedSearchGuided.html](http://support.ebscohost.com/training/flash_videos/advancedSearchGuided.html)

- **Advanced EBSCOhost tutorials here:**
  [http://support.ebscohost.com/training/tutorials.php](http://support.ebscohost.com/training/tutorials.php)
For Practice:

- Ch.3. Access: Basic Search Practice for PubMed and EBSCOhost