Outpatient Clinic Article
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TIPS FOR FINDING CLINICAL INFORMATION

MEDLINE

Database maintained by the National Library of Medicine (NLM) with over 7 million references and growing. This is the premeire medical database and is the best place to search for medical information.

There are a number of interfaces that allow one to search the MEDLINE database and retrieve information. Each one is unique and has its own advantages, disadvantages and idiosyncronicities. The Christ Hospital uses Ovid for this purpose. [see accompanying handout on Ovid]. I also recommend the Internet Grateful Med database at the NLM (http://www.igm.nlm.nih.gov) -- rather than the PubMed interface. The IGM allows for more "control" of the search.

Some general statements can be made about searching:

- if you start with a focused clinical question, you will have better search results.
- the more you know about your database the better you will search.
- limit (or restrict) your search as much as possible.
    - limit to English articles -- unless you are fluent in other languages and can wait several months for the library to retrieve the reference.
    - limit to core journal (AIM in Ovid) as these journals are found easily and are generally considered "best" [NEJM, JAMA, BMJ, Lancet, etc.]
    - restrict years of focus (don't search for tPA in the 1960s)
    - expand the years of searching if your results are not adequate. Not all topics will have articles, studies written in the past 3 to 5 years.
- if you need basic information use textbooks, overview (review) articles, etc.

One last recommendation about general information. Review articles can be very biased towards the views of the author(s). This is generally true of reviews in the *New England Journal of Medicine,* which I recommend avoiding. Overviews or Meta-Analyses are much more reliable and unbiased.

Recommended Internet Sites

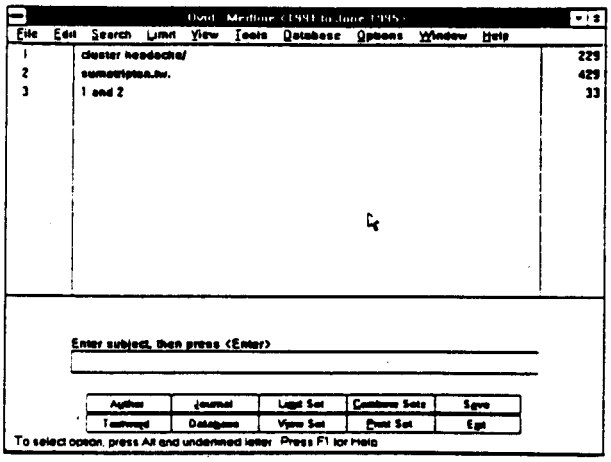
Please also see the handout from Grand Rounds 10/01/98 which contains many good sites for yourselves and your patients. Some other recommended sites include:

Evidence-Based Care Home Page	http://hiru.hirunet.mcmaster.ca/ebm/
Bandolier	http://www.jr2.ox.ac.uk/bandolier/index/html
Centre for EBM	http://cebm.jr2.ox.ac.uk

Ovid 3.0

Quick Reference Card

Windows Version



Subject Search

Begin a search by entering a single subject word or phrase at the Command Line, then pressing <Enter>. Your entry will be mapped to a valid subject heading, or it will be automatically searched in the subject fields of the database.

Author Button

Search for documents by a specific author.

Journal Button

Search for documents in a specific journal.

Textword Button

Search for a term in the text fields of the database [e.g. in most databases, the titles and abstracts fields].

Limit Button

Restrict the results of a search by a limit factor, such as language, year or latest update. You will be prompted to select one of your sets, and choose a limit factor from a list of available limits.

View Set Button

View documents from a search set. Documents may also be printed or saved from the display screen.

Combine Sets Button

Combine the results of two or more search sets. You will be prompted to select sets, and choose a Boolean Operator [e.g. ***and, or***].

Database Button

Start a search in a new database or database segment. You will be prompted to choose from a list of the available databases.

Print Set Button

Send documents from a search set to the printer. A dialog box will be displayed, allowing you to customize your printout.

Save Button

Save documents from a search set, or a search strategy to a file. You will be prompted to choose a file type, name the file and modify default formats.

Saving and re-executing a search strategy

Saving:

- Choose File/Save from the menu (or click the "Save" button)
- Select "Strategy" from the list of options
- A dialog box will be displayed with options to name the file, a comments, and designate the destination path.

Executing:

- Choose Search/Execute from the menu
- You will be prompted to open a file from either the floppy or drive; and then may select a saved file from the displayed list.

Professional Syntax

Field Qualification:

- Individual fields may be searched from the command line usir the appropriate two letter field identifier, set off with either periods or parentheses. E.g. ***diazepam.ti.*** or ***diazepam (ti)*** See the Search/Individual Fields menu item for a complete list of searchable fields.

Index Searching

- Display any field index by using the **nbr** or **root** commands. ***nbr food.ti.*** or ***root food.ti.*** See the Search/Indexes menu it for a complete list of searchable indexes.

Boolean and Positional Operators, Combining Terms

(pregnancy or childbirth).ti. [either term appears in the title]
(pregnancy and childbirth).ti. [both terms appear in the title]
(pregnancy not childbirth).ti. [the first term, but not the secon term appears in the title]
1 or 2 [retrieves all documents from sets 1 or 2]
pregnancy tests.tw. [adjacency is assumed]
(information adj5 retrieval).tw. [retrieves phrases in which "in mation" and "retrieval" are within five words of each other in eit direction]

Truncation [statements should be field qualified]

- Use $ or : to replace an unlimited number of characters (e.g. ***journal of pharmac$.jn.***)
- Use # to replace one character (e.g. ***wom#n.ti.***)
- Use ? to replace 0 or 1 character (e.g. ***colo?r.tw.***)

Using Subject Headings [for databases with a thesaurus]

eye/	Bypass thesaurus
eye/de or ***eye/de,su***	Include indicated subheading(s)
ex eye or ***exp eye***	Explode a subject heading
****eye***	Restrict to focus articles
ptx eye	View the Permuted MeSH index
tree eye	View a term in the MeSH tree
scope eye	Display scope note for the term

The well-built clinical question: a key to evidence-based decisions

Consider the following clinical situations:

A 19-year-old woman comes home from college with an acute maxillary sinusitis. You just heard about treating this with a shorter 3-day course of antibiotics rather than the usual 10 days of prescribed treatment. You wonder whether you should try the shorter course with this patient.

A 44-year-old woman with recently diagnosed ovarian cancer presents to the emergency room with dyspnea and inspiratory chest discomfort. The ventilation–perfusion scan is read as "indeterminate." The emergency room doctor asks your advice "now that embolism has been ruled out."

A 69-year-old retired teacher returns for follow-up of congestive heart failure that first presented 1 month before. After you review her progress, she asks you about her prognosis.

What do these scenarios have in common? Among other things, they are all opportunities to make explicit and systematic use of the best available evidence when teaching and practicing clinical medicine. In other words, they are moments of opportunity for evidence-based medicine (1, 2). Many readers of *ACP Journal Club* are already recognizing and capitalizing on these moments in their daily work. In so doing, these clinicians are using their searching skills to track down published evidence; they are using their critical appraisal skills to judge the scientific validity and clinical usefulness of that evidence; and they are using their clinical judgment to decide with their patients how best to put the evidence into practice. For these steps to be efficient and effective, they must start by using an additional fundamental skill for evidence-based medicine: asking well-built clinical questions.

What makes a clinical question well built? First, the question should be directly relevant to the problem at hand. Next, the question should be phrased to facilitate searching for a precise answer. To achieve these aims, the question must be focused and well articulated for all 4 parts of its "anatomy" (3): 1) the patient or problem being addressed; 2) the intervention or exposure being considered; 3) the comparison intervention or exposure, when relevant; 4) the clinical outcomes of interest. For example, for the clinical scenarios we began with, the following questions could be asked:

In adults with acute maxillary sinusitis, does a 3-day course of trimethoprim–sulfamethoxazole yield the same cure rates as a 10-day course, with fewer adverse effects and costs?—a question of therapy (4).

When compared with pulmonary angiography, how well does an indeterminate result of a ventilation–perfusion scan rule out pulmonary embolism in a patient with a high pretest probability?—a question of diagnosis (5).

What is the average survival after onset in patients with congestive heart failure, and what clinical features, if any, identify patients likely to survive longer or shorter than average?—a question of prognosis (6).

How often do clinicians ask questions about their patients? Investigators have observed and interviewed doctors while they practice, counting the questions. The rate of question asking in these studies ranged widely, from as few as 1 question every 15 patients in outpatient family practices (7), to 1 question every 1 or 2 patients in mixed specialty offices (8, 9), and up to 5 questions per patient on an inpatient teaching service (10).

But can clinicians actually ask focused, 4-component questions? We believe so, but, as with many clinical skills, it takes practice. Doing it well requires that you have insight into what you do not know, coupled with curiosity and a willingness to learn. Also, knowing how questions arise, where they come from, and how to recognize and articulate them can help you refine your skills.

How do clinical questions arise? During a patient encounter, the clinician may be uncomfortable making a decision until more is known. Finding these "knowledge gaps" can cause the clinician to react in several ways, some affective, such as with anxiety or guilt, and some cognitive, such as asking questions and searching for answers. Although not always possible, we recommend quieting your emotions while turning your implicit knowledge gaps into explicit questions.

Where do these questions come from? They can arise from virtually any point in the clinician's work with patients. After years of being asked questions, as well as asking our own, we have found that most of our questions arise from the following 6 aspects of clinical work:

1. Clinical evidence: how to gather clinical findings properly and interpret them soundly.
2. Diagnosis: how to select and interpret diagnostic tests.
3. Prognosis: how to anticipate the patient's likely course.
4. Therapy: how to select treatments that do more good than harm.
5. Prevention: how to screen and reduce the risk for disease.
6. Education: how to teach yourself, the patient, and the family what is needed.

We keep this list handy and use it to "map" where clinical questions come from.

How can you recognize and formulate clinical questions as they occur? Here are some tactics that we have found useful. First, pay careful attention to the questions that spontaneously occur to you. Also listen

for the "question behind the question"; thus, "should I increase this patient's diuretic dose beyond the recommended daily maximum?" might become "in this patient with uncontrolled heart failure despite full doses of diuretic and an angiotensin-converting enzyme inhibitor, should I add digoxin to reduce congestion and improve exercise tolerance?"

Next, try saying your questions out loud or writing them down with all 4 components included. If you are stuck, use the map above to locate where you are stuck. Then build your question in 2 steps, starting with the "location," such as "my question is about therapy," then filling in all 4 components explicitly, such as "do persons with insulin-dependent diabetes who are treated with an intensive insulin regimen have fewer long-term complications or a lower mortality rate than those treated with a traditional insulin regimen?"

What if too many questions arise? For patients who have more than 1 active problem, and with possible questions about diagnosis, prognosis, therapy for each problem, your questions may be too numerous to even ask, let alone answer. In this predicament, we still recommend building good questions, then selecting from the many the few questions that are most important to answer right away. If you are stuck on this selection, try this sequence of queries: What is the most important issue for this patient now? What issue should I address first? Which question, when answered, will help me most?

After some practice, you should be able to recognize key clinical questions readily and build them well to help you find the answers. We invite correspondence from those who want to become better question-askers on the way to becoming better clinicians.

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Robert S.A. Hayward, MD, MPH

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Beyond *ACP Journal Club*: How To Harness MEDLINE for Diagnostic Problems

The previous editorial in the MEDLINE series, published in the July/August 1994 issue of *ACP Journal Club*, was on searching for articles addressing therapy questions. This editorial deals with searching for articles on the diagnosis of clinical problems. As with the other editorials in the series, we start with a clinical situation.

One of your long-standing patients, a 50-year-old woman, has made an appointment to ask for your advice. She has come in often over the years with various complaints, including some vague stomach and bowel upsets and weight swings that seem to "run in the family." She is generally healthy although a bit thin. Her niece has been diagnosed with celiac disease. She asks you if screening certain members of her family for this condition might be warranted. Both you and your patient are not all that happy about the prospect of small-bowel biopsy. She asks you about the availability of other less invasive tests.

You remember reading about the diagnostic value of the gliadin antibody test for celiac disease. You tell her you will check to see if the test could be used as a substitute for the biopsy.

You check your personal reprint file and some general medicine evidence-based texts on diagnosis (1-3) and do not find any references to either the test or the disease, even using alternative names such as sprue and gluten enteropathy. *Scientific American Medicine* (4) does not mention the gliadin test but suggests using fecal fat analysis with the biopsy. *ACP Journal Club* has not included a single article on celiac disease. It is now too late to call the local gastroenterologist. MEDLINE is next on the list.

Each of the 7 million citations in MEDLINE includes the title of the article, authors, the abstract if available, and keywords assigned by content experts working for the National Library of Medicine (NLM). When you search, you can use the index terms given to the article (Medical Subject Headings [MeSH]), or words in the titles and abstracts of the original article, or a combination of these 2. In other words, you search by trusting the indexers (MeSH headings), the authors (title and abstract), or combine both. Most often, the indexing is a good first approach for MEDLINE searching. By using the indexing, you avoid some of the difficulties of having synonyms for items (e.g., celiac disease, sprue, steatorrhea, and gluten enteropathy), alternative spellings and word endings (e.g., etiology vs. aetiology; esophagitis vs. oesophagitis; and random vs. randomized), and different meanings for the same word (e.g., shoe polish vs. speaking Polish; and AIDS, the disease vs. hearing or teaching aids).

Using title and abstract searching (called textword searching) can be helpful for new concepts or ideas that the indexers have not yet incorporated. For example, it took some time for MEDLINE to include Legionnaire's disease as a MeSH term and restenosis is still on the waiting list. Furthermore, some concepts are not indexed consistently (e.g., sensitivity, specificity, positive and negative likelihood ratios). 2 sample searches follow that show the different approaches and output for a search to find articles that provide the sensitivity, specificity, and predictive values of gliadin antibody tests for screening for celiac disease.

This first search is a textword search:

gliadin
AND
sensitivity OR specificity OR likelihood OR predictive
AND
celiac OR sprue OR stretorrhea OR gluten enteropathy
AND
human
AND
English language

This search retrieves 37 citations from 1991 forward, about half of which are relevant to the topic.

The second search, based on MeSH headings is as follows:

gliadin (mh)
AND
celiac disease (mh)
AND
exp sensitivity (mh)
AND
human (mh)
AND
English language (la)

This search retrieves 22 citations, 19 of which were in the first search plus 3 unique citations. Although there were fewer citations in the second search, a larger proportion of them were "on target" than those citations in the textword search.

Either set of citations can help answer the question about the diagnostic properties of gliadin. One of the first citations in each set is abstracted in this issue of *ACP Journal Club* (*see* page 51). Bodé and Budmand-Høyer (5) conclude that for adults the sensitivity of the gliadin antibody test was 77%, specificity was 95%, the positive predictive value was 71% to 90%, and the negative predictive value was 97%. The commentator concluded that the gliadin antibody test is an effective noninvasive screening test for patients

with suspected celiac disease. A biopsy, however, is still needed to confirm the diagnosis.

Our previous editorial provided the single terms for effective searching for studies of therapy. Table 1 has the best single terms for effective searching for studies of diagnostic tests. We have included 2 searching terms to give you a choice of high sensitivity or high specificity.

If the search terms in Table 1 do not provide satisfactory results, many options exist that could help, including 1 or more terms in Table 2.

NLM and other vendors produce many databases, and some of these may be better tailored to specific clinical questions than the general MEDLINE file. Most searching systems, including GRATEFUL MED, can access these databases. Others are available only through specific vendors who provide various "subsets" of MEDLINE and journals to suit specialized interests. EMBASE (*Excerpta Medica* online), a European "equivalent" to MEDLINE, is another general alternative to MEDLINE with an overlapping set of journals.

The following specialized literature databases are available through NLM and other vendors. AIDSLINE contains references on AIDS and related topics. References are taken from MEDLINE, HEALTH, and CANCERLIT databases from 1980 forward, with additional unique citations added. AIDSLINE and other AIDS-related databases such as AIDSTRIALS and AIDSDRUGS are available free of charge for both health care professionals and consumers.

AVLINE is an audiovisual catalogue that contains listings for all audiovisual materials catalogued by NLM since 1975. The materials are intended for health professionals rather than patients.

Table 1. Sensitivity and Specificity for the Best Single Searching Terms

Best Single Searching Term	Term Sensitivity		Term Specificity	
	Before 1990	1990 and On	Before 1990	1990 and On
sensitivity (tw)	43%	57%	98%	97%
diagnosis& (px)*	91%	80%	62%	77%

* Note that the terms diagnosis& (px) means that all the MeSH subheadings that deal with diagnosis will be included in the search automatically, a feature called "exploding" or, in this case, "pre-exploding." We discussed exploding in our previous editorial when we grouped all types of headaches together for the therapy scenario.

CANCERLIT provides citations to cancer literature. Books, technical reports, meeting abstracts, meeting papers, and theses are also included. Material dates back to 1963.

CATLINE contains citations to printed books and journals in the collection at NLM.

CHEMLINE is a combined dictionary and database containing data that can be helpful in selecting strategies for other NLM databases. A user can identify a substance, determine its Chemical Abstracts Registry number, and find out which databases would carry more information on the substance.

DIRLINE contains information on over 15 000 organizations that act as information resource centers. DIRLINE references include names, addresses, telephone numbers, and descriptions of each organization, including primary interests and services.

HEALTH Planning and Administration database provides references back to 1975 on nonclinical aspects of health care delivery including administration and planning of health facilities, services, health insurance, and health care aspects of financial management, regulation, personnel, quality assurance, licensure, and accreditation.

SDILINE is a database that contains references from the current month of MEDLINE and permits you to "store" searches for automatic updating each month.

TOXLINE and TOXLINE65 contain references to the pharma-

Table 2. Textwords and MeSH for Searching for Diagnostic Problems

Textwords for Searching for Diagnostic Problems	MeSH for Searching for Diagnostic Problems
sensitivit:	sensitivity and specificity
specificit:	predictive value of tests
predictive and value:	ROC curve
false and reaction:	false negative reaction
likelihood and ratio:	false positive reaction
	diagnosis, differential
	mass screening
	diagnostic use (sh)
	diagnosis* (sh)

* This subheading can be used in various ways by different searching systems. Use your manual or check with a medical librarian for exact uses and searching conventions.

cologic, physiologic, biochemical, and toxicologic effects of drugs and other chemicals. TOXLINE has the cur-rent files.

TOXLIT and TOXLIT65 contain references covering the pharmacologic, physiologic, biochemical, and toxicologic effects of drugs and other chemicals. These files carry royalty charges and are more expensive to search than TOXLINE and TOXLINE65. The toxicology files have some overlap, but enough citations are unique that both may need to be searched for comprehensive retrievals.

Again, we welcome your comments on this series. If you have questions about searching that you would like addressed, please send them to us. Our address and telephone and fax numbers are on the masthead page.

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CORRECTION

A sentence in the commentary for the abstract "Serum Lipid Concentrations, Obesity, and Mortality in Women" (1) should read as follows: Unfortunately, the study, which began in 1968, *did not* measure HDL cholesterol, low values of which might have explained the higher risk for hypertriglyceridemia.

Reference

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