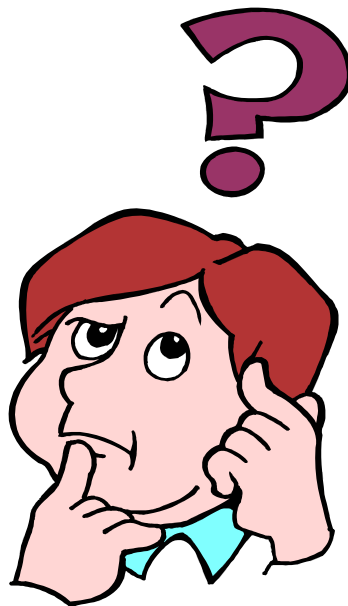


Chapter 2

Asking:

Constructing the Patient Focused, Searchable Clinical Question



**Structuring the search
for information and evidence**

Introduction:

A clinical question is generally defined as a question pertaining to a health care provider's management of a patient or population of patients that is answerable through print or electronic resources. Clinical questions can be divided into two general categories: background and foreground questions.

Background clinical questions can usually be answered by information from textbooks, websites and hospital or office information resources such as patient history files. Background questions typically focus on general information needed or a specific concept (an intervention, an aspect of a disease or disorder, the determination of possible therapies). Background questions generally begin with a question root such as who, what, when, why, or how. A good background question might include: what are effective massage or manipulative therapies for carpal tunnel syndrome.

Foreground clinical questions usually seek to find relevant, sometimes individualized, evidence from primary research publications or secondary, synthesized publications built from primary research papers. Foreground questions typically include three to four component terms or key words focused on the patient, intervention, comparison to the intervention and outcome desired. of the PICO components

The PICO question is a convenient and conventional format to use when composing good clinical questions to direct an evidence-based search of research literature. PICO stands for Patient, Intervention, Comparison and Outcome; thus, there are four components of a good clinical question based on the PICO format.

The various components of the good clinical question can be thought of as **data fields** that will aid in the search for evidence and answers. The component terms can be used as key text words when using a search engine or database management system (DBMS – a “search engine” for databases). In addition, databases are often set up with searchable data fields, indexed terms and controlled vocabulary terms such as the National Library of Medicine's PubMed medical subject headings or “MeSH terms.”

Tailoring the clinical question's component terms will help define and refine searches of medical literature databases. Each component term can be used as a search term when searching the internet and web pages with search engines or databases using a database management system (DBMS).

Background questions are composed of fewer components, broader terms and return more numerous (and sometimes less relevant) results. Background terms can often be substituted with specific synonyms can found in the controlled vocabulary links of a database to produce a more specific search.

Foreground questions typically use three or four component terms. Foreground questions use more specific terms and often return fewer but more relevant results.

Patient:

Defining the patient characteristics is essential. A specific, narrow definition will provide very applicable evidence for that particular patient, but may limit the evidence too much so that important evidence is excluded from search results. A common error is to specify a particular narrow age range when it is unlikely to make any difference to the eventual outcome of the intervention. Race or sex can be essential to some health issues, but inclusion may limit the retrieved results. Be prepared to search with and without some terms and limits such as age, sex and race. Be specific without becoming too narrow. Consider key words and phrases that will allow a health care provider imagine the patient in front of you. Try not to include irrelevant or extraneous information or terms.

Intervention:

An intervention component may be broad or narrow. When seeking “best evidence,” several interventions may be specified in separate foreground questions. Broad phrases (“What is most effective?”) often lead to background questions. Searching for background information from reliable, high quality resources such as current textbooks, guidelines, reference handbooks and websites such as Natural Standards, Natural Medicine, AHRQ, and MedLine Plus can help narrow the intervention component so a good foreground clinical question can be composed from a background question. A specific intervention should suggest something that will influence the desired outcome.

Comparison:

The comparison component often is the “second half” of the intervention component. In therapy questions, intervention A might be compared to a well-known or standard therapy. For diagnosis questions, the comparison is often the “gold standard” diagnostic. Prognosis or etiology questions may include a factor which may affect the patient population in some way. In some cases, including symptoms (e.g., chronic cough, low serum iron) or exposure factors (e.g., second hand smoke) in this component may provide a way to narrow the search without excluding essential results.

Outcome:

The last component of the PICO format is the Outcome. The “outcome” is what the clinician hopes to accomplish. An outcome should be patient oriented (taking patient values, expectations, preferences and priorities into consideration), definable, measurable, and clinically relevant. In many cases, there will be more than one relevant, important outcome that depend on what aspect of care is needed or desired. Each outcome can be defined in a separate PICO question. Outcomes should not be vague (“feel better”) since vague phrases are not measurable and will not help define a search strategy for relevant evidence. Outcomes such as “decrease pain” or “decrease the time to return to normal activities” and “increase physical function” which can be defined and measured may restrict a search, but should be considered once again when evaluating results from a search (i.e., when evaluating the methods section of selected results for relevance to the PICO question).

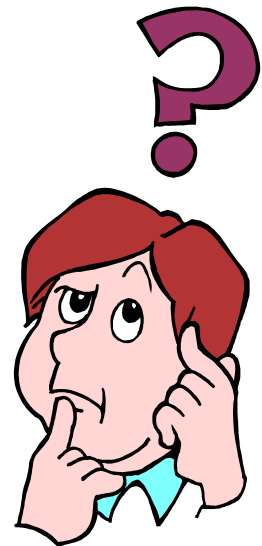
Ask a focused, “searchable,” clinical question

P Patient, population, condition

I Intervention, (therapy, diagnosis, exposure)

C Comparison (alternative)

O Outcome



- Determines what information we need
 - Identifies what we know (patient scenario)
 - Identifies what we don't know (knowledge gap)
 - Identifies what we need to know
 - Background (general) information
 - Foreground (specific, current) information & evidence

- Establishes a framework for searching the medical and scientific literature for evidence
 - Structured search strategy
 - Use PICO component key word synonyms as “data fields” for a search
 - Use key word components to refine search queries

Composing a good, searchable, clinical question

To compose a good clinical question, consider key criteria for Patient, Intervention, Comparison and Outcome.

Background / broad:

What are the appropriate indications for [procedure X]?

Foreground / more specific:

Does [procedure X] improve [certain outcomes] for [certain types of patients]?

OR

For [what types of patients] is there strong, (peer-reviewed) evidence that [procedure X] improves [certain outcomes]?

In some cases, in order to better define the clinical “knowledge gap,” background questions may be composed in order to focus an information seeking strategy that will enable the clinician to revise their question into a focused, foreground, evidence seeking clinical question. The clinician will typically use controlled vocabulary lists in medical literature databases such as the medical subject headings (“MeSH terms”) in PubMed or subject terms in EBSCOhost and CINAHL. Alternatively, the clinician can narrow the clinical question and thus the search bibliographic databases of the medical literature using compiled evidence websites such as

- Natural Standard (www.naturalstandard.com),
- Natural Medicines Comprehensive Database (http://www.naturalmedicines.com/member_home.asp)
- The US federal Agency for Healthcare Research and Quality (www.ahrq.gov) and
- The US National Library of Medicine’s MedlinePlus (www.nlm.nih.gov/medlineplus/).

To refine a clinical question in order to focus a search, broader component terms are replaced with more specific terms. Adding terms will also refine or narrow searches, resulting in fewer, more relevant results. Each intervention and outcome may be included in separate questions with an appropriate comparison component.

In the associated assignment, you will read several patient scenarios and compose appropriate background and foreground, evidence seeking clinical questions using the PICO format. These PICO questions will be used In future exercises where you will have the opportunity to construct and perform searches of the medical literature databases.

The Background Question

Used to find general information

- question root (who, what, when, why, how...)
- specific concept: intervention, comparison alternative disorder or disease, or aspect of the disorder

Examples:

- **What are** [effective CAM therapies] for [mild to moderate depression OR seasonal affective disorder] in [adults]?
- **How** does [chiropractic therapy OR chiropractic manipulation] affect [mild to moderate depression OR seasonal affective disorder] in [adults]?
- **What are** [effective botanical supplements] as [alternatives for prescription medication] for relief of [mild to moderate depression OR seasonal affective disorder] in [adults]?
- For [adults] with [chronic (neck /back) pain], **what is** an effective [chiropractic / alternative therapy] to [alleviate symptoms of depression]?

Where to Look for Answers:

- Look at compiled evidence websites with database management systems (DBMS) to focus your background questions
 - Evidence based summaries and systematic reviews
 - Synthesized information and evidence
- Try limiting your patient population (e.g., “adult, male, asthma”), then running a similar search without the limits (patients with “asthma”)
 - Most databases have fields where limits and filters can be set
 - Save your searches & search strategies
- Many databases have a specific “controlled” vocabulary (Medical Subject Headings – MeSH) that help define diagnosis, interventions and outcomes.
- Textbooks / reference handbooks
- Colleagues, faculty, mentors, professional societies

The Foreground Question

Used to find specific, current information

- Patient or population focused
- “Narrows” or focuses the search using more keywords and “data fields”
- Use compiled evidence websites and databases to find alternative terms for patient conditions, interventions, exposures and diagnostic tools
- Substitute synonyms from database controlled vocabulary (Medical Subject Headings in PubMed – MeSH, or “Subject Headings” other databases)
- Clinically relevant outcome

Examples:

- For [adults with chronic (neck / low back/ lumbar / cervical) pain], does [chiropractic / conservative care / manual therapy / massage / acupuncture] [alleviate symptoms of depression / alleviate pain / increase range of motion / back to work] better than [surgery OR medication]?
- For [adults with mild to moderate depression], will [St. John’s Wort] alleviate chronic [(low) back pain] or [neck pain]?
- For [adults with mild to moderate depression], will [chiropractic] alleviate [(chronic) (low) back pain] or [neck pain]?

Formatting:

- Is [light therapy] ¹ as effective as or better than [prescription drugs] for the [alleviation of symptoms of mild to moderate depression OR SAD OR specific symptoms: insomnia, chronic back pain, mood swings] ² in [adults] ³?

 1. Use different therapies or the Complementary an Alternative Medicine limits in PubMed and EBSCOhost (and other databases)
 2. Perform single searches with Boolean operators (AND, OR, NOT – all capitals)
 3. Perform separate searches (save searches in database specific “accounts”)

Where to Look for Answers:

- Current primary (“original”) research papers
 - Basic science, clinical
- Current secondary, peer reviewed scientific information
 - “synthesized,” summarized



Natural Standard

The Authority on Integrative Medicine

SEARCH FOR

HOME

About Us

Products

News & Events

Blog

Audio

Dictionary

Education

Practitioners

Demo

Subscribe

Login

Logout

Natural Standard was founded by clinicians and researchers to provide high quality, evidence-based information about complementary and alternative therapies. This international multidisciplinary collaboration now includes contributors from more than 100 eminent academic institutions.

DATABASES



[Herbs & Supplements](#)



[Health & Wellness](#)



[Allergy & Immunology](#)



[Condition Center](#)



[Brand Names](#)



[Interactions](#)

For each therapy covered by **Natural Standard**, a research team systematically gathers scientific data and expert opinions. Validated rating scales are used to evaluate the quality of available evidence. Information is incorporated into comprehensive monographs which are designed to facilitate clinical decision making. All monographs undergo blinded editorial and peer review prior to inclusion in **Natural Standard** databases.



Natural Standard is impartial; not supported by any interest group, professional organization, product manufacturer. Institutional subscriptions, custom content and licensing are available.

[RSS Feeds](#)  | [Newsletter](#) | [Links](#) | [Testimonials](#) | [Terms of Use](#) | [Technology FAQ](#) | [Contact Us](#)

Natural Standard (www.naturalstandard.com)

Natural Standard is an evidence-based informational “compiled evidence website focused on complementary and alternative therapies including herbs, supplements, manual medicine and acupuncture. Natural Standard rates the strength of compiled evidence. Available by subscription, Natural Standard requires NUHS IP address recognition and must be accessed on campus. Sign up for a monthly newsletter delivered to your personal e-mail.

- Use the search bar for text word searches using key PICO component words
- Click on specific database links to find more focused information
- Search within databases using text search or browsing titles and links
- Information uses primary research and secondary literature
- Information is rated by experts in the field (A, B, C, D)
- Subscribe to RSS feeds for updated information on specific topics
- A monthly newsletter contains summarized, synthesized information on hot topics in health care.

Search:

[Advanced Search](#)

Welcome!



- Home
- Search
- Continuing Education
- Clinical Mgmt. Series
- Colleagues Interact
- About the Database
- Evidence-Based
- Read Reviews
- PDA Version **New!**
- Email Us
- Positions Open **New!**
- Our Team
- Newsroom



Search

- **Search** - enter any natural product name, disease or condition, or drug name...gives you objective product information, Effectiveness Ratings, or potential interactions with drugs, etc.
- **Natural Product Effectiveness Checker** - tells you the level of effectiveness for natural products used for various medical conditions.
- **Natural Product / Drug Interaction Checker** - tells you potential interactions between any natural product and any drug. Automatically checks for interactions with EACH INGREDIENT of each product.
- **Disease / Medical Conditions Search** - shows you medical conditions, and allows you to see which natural products might be effective.
- **Search Colleagues Interact** - shows you questions, answers, and comments posted by other health professionals.
- **Advanced Search** - helps you find specific information or keywords anywhere in the *Database*.

Clinical Management Series

New Featured: Aging Skin

- ADHD
- Allergic Rhinitis
- BPH
- Colds and Flu
- Depression
- Menopause
- Obesity
- Osteoporosis
- **SEE ALL 29 Courses**

Available as CE/CME for Subscribers

CE

Currently Accredited CE or CME for physicians, pharmacists, NPs, PAs, RDs.

FREE Online CE for you as subscriber

- [Select a Course/Take a Quiz](#)
- [View your history & credits](#)
- [Print Statements](#)

Colleagues Interact

- [See what your colleagues are saying](#)
- [Post a message if you want](#)

Manage My Account

- [eUPDATE](#)

Special Reports

CE Login

Get Your CE Credit Now

CE ID#: (CE info)

[I forgot my CE ID #](#)

You Can Purchase Access To:

- PHARMACIST'S LETTER** 
- PRESCRIBER'S LETTER** 
- IDENT-A-DRUG REFERENCE** 

[How to find USP Verified Products](#)

USP Verified

Natural Medicines Comprehensive Database now collaborates with **U.S. Pharmacopeia (USP)** to tell you which natural products are



Natural Medicines Comprehensive Database

http://www.naturalmedicines.com/member_home.asp

Natural Medicines provides evidence-based clinical information for natural medicines and products. It is available by subscription and uses IP address recognition for NUHS on campus access.

- Use the search bar for text word searches using key PICO component words
- Search summarized information links for effectiveness information, grading, specific conditions
- An advanced search helps find specific information and alternative key words
- PDA versions and RSS feeds are available

- A-Z Quick Menu**
- Select Topic
- Clinical Information**
 - Consumer Health**
 - Funding Opportunities**
 - Data & Surveys**
 - Research Findings**
 - Specific Populations**
 - Quality & Patient Safety**
 - Health IT**
 - Public Health Preparedness**
 - About AHRQ**
 - Mission & Budget
 - Strategic Plan
 - Organization & Contacts
 - Map & Directions
 - Events & Announcements
 - Job Vacancies
 - Special Interest**
 - State & Local Policymakers
 - Nursing Research
 - PDA Applications
 - How AHRQ Helps People

•Clinical Information

- Evidence-based Practice
- Outcomes & Effectiveness
- Effective Health Care
- Technology Assessment
- Preventive Services
- Clinical Practice Guidelines
- National Guideline Clearinghouse™

•Funding Opportunities

- AHRQ Research Agenda
- Funding Announcements
- Electronic Grant Applications
- Research Policies
- Grants Process
- Grant Application Basics
- Grants On-Line Database
- Training and Education
- Contracts

•Research Findings

- Research Activities: [Online Newsletter](#)
- Research Topics: [Fact Sheets/Syntheses](#)
- Primary Care
 - Mental Health
 - Long-term Care
- Markets
 - Methods
- **Public Health Preparedness**

•Specific Populations

- | | |
|----------------|----------------|
| • Women | • Disabilities |
| • Children | • Low Income |
| • Minorities | • Inner City |
| • Elderly | • Chronic Care |
| • Rural Health | • End of Life |

•Consumers & Patients

- Be an Active Health Care Consumer
- Health Conditions/Diseases
- Health Plans
- Prescriptions
- Prevention & Wellness
- Quality of Care
- Questions Are the Answer
- Quit Smoking
- Surgery

•Data & Surveys

- MEPS
 - [Medical Expenditure Panel Survey](#)
- HCUP
 - [Healthcare Cost & Utilization Project](#)
 - [HCUPnet](#)
 - [Interactive Tool for Hospital Statistics](#)
- [HIV & AIDS Cost & Use](#)

•Quality & Patient Safety

- [Health Information Technology](#)
- [National Quality Measures Clearinghouse™](#)
- [CAHPS® Consumer Assessment of Healthcare Providers and Systems](#)
- [Health Care Innovations Exchange](#)
- [Measuring Healthcare Quality](#)
 - [Quality and Disparities Reports](#)
- [Medical Errors & Patient Safety](#)
- [Patient Safety Network](#)
- [WebM&M Morbidity & Mortality Rounds](#)
- [Quality Indicators](#)
- [Quality Information & Improvement](#)
- [Quality Tools](#)
- [TalkingQuality Communicating with Consumers](#)

Questions Are the Answer

Spotlight

- [Podcast: MRSA Infections and Atypical Antipsychotics](#)
- [Privacy & Security Solutions for Health Information Exchange](#)
- [Emergency Atlas for Nursing Home & Hospital Disaster Preparedness](#)

News & Information

- [Newsroom](#)
 - [Media Resources](#)
- [Healthcare 411 Podcasts](#)
- [Publications & Products](#)
- [Information Quality Guidelines](#)
- [Freedom of Information](#)
- [Electronic Policies](#)
- [Copyright](#)
- [Linking](#)
- [Other HHS Agencies](#)

US federal Agency for Healthcare Research and Quality (AHRQ) (www.ahrq.gov)

AHRQ is a division of the US Department of Health and Human Services whose mission is to improve the quality safety, efficiency and efficacy of health care for all Americans. Use the Clinical Information link to search specific topics and clinical questions. Access and information is free through the internet.

- Use the search bar for text word searches using key PICO component words
- Go to the Clinical Information link Clinical Information and browse the evidence based practice information and resources.
- Go to the Outcomes and Effectiveness link for alternative PICO synonyms
- Mainly secondary, synthesized information, AHRQ summarized primary research and often provides links to specific literature through links to abstracts archived in PubMed.

The US National Library of Medicine's MedlinePlus [\(www.nlm.nih.gov/medlineplus/\)](http://www.nlm.nih.gov/medlineplus/)

MedlinePlus is an free, open access website run as a service of the National Library of Medicine and US National Institutes of Health, containing information and links to research aimed at the professional as well as the consumer levels. It can be accessed and searched independently or linked through the NLM's National Center for Biotechnology Information (NCBI) database management system Entrez PubMed.

- Use the search bar for text word searches using key PICO component words
- Entrez PubMed (database management system for the National Library of Medicine's bibliographic database of medical and scientific literature) includes Medline links and information
- National and international media outlets (TV channels, radio, cable, newspapers and magazines) often report on topics covered in "Current Health News." If a patient says, "I heard on..." or "I saw in ..." check Medline to see if the topic was covered.
- Links to the primary research literature (through PubMed) are often included in summaries.

References

"Asking answerable clinical questions" in D.L. Sackett, S.E. Straus, W.S. Richardson, W. Rosenberg, and R.B. Haynes. Evidence-based Medicine: How to Practice and Teach EBM. New York: Churchill Livingstone, 2000. p.13-27.

Weinfeld JM and K Kinkelstein. How to answer your clinical questions more efficiently. Fam Prac Mgmt. 2005;Jul-Aug:37-4

Huang X, J Lin, D Demner-Fushman PICO as a Knowledge Representation for Clinical Question sarchive.nlm.nih.gov pubs

Virgilio RF, Chiapa AL, Palmarozzi EA. Evidence-Based Medicine, Part 1. An Introduction to Creating an Answerable Question and Searching the Evidence. JAOA 2007; 107:8.295-297