Evidence–Based Practice

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May 2018

TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER
Libraries *of the* Health Sciences

Basics: Evidence–Based Practice

Use of Evidence–Based Practice resources is an important part of information literacy in health care and health sciences.

This module is a web–based tutorial designed to teach beginning biomedical and health care students about Evidence–Based Practice principles and resources.

Goals

- To comprehend:
  - the principles of Evidence–Based Practice.
  - the use of Evidence–Based resources.
  - and to be motivated to strive for better patient outcomes.

Objectives

During this learning module, participants will:

- learn the definition of Evidence–Based Practice (EBP).
- understand the steps of the EBP process.
- recognize central issues around which clinical questions revolve: diagnosis, therapy, prognosis, or etiology.
- know how to build focused clinical questions with PICO.
- learn how to use the Evidence–Based literature searching tool *PubMed's Clinical Queries.*
- identify a discipline–related EBP point–of–care tool and learn how to access a guide or tutorial.

Objectives continued

- become familiar with types of study design and the hierarchy of study designs.
- learn about quality of evidence and the Strength of Recommendation Taxonomy.
- describe criteria used to evaluate resources critically.
- consider how to integrate evidence-based practice with the patient's values
- recognize the visual elements necessary for low literacy health education tools.
- recommend *MedlinePlus.gov* to patients.

Definition and Process

What is Evidence–Based Practice?

Evidence–Based Practice (EBP) requires the integration of the best research evidence with clinical expertise and the patient's unique values and circumstances. *(Straus, 2005)*

Steps in the Evidence–Based Process are:

Assess
- In priority, what are the issues?
- Is it critical, correctable, common, contextual, comprehensive?

Ask
- What is the question's study category? Prevention? Therapy? Harm/Causation? Diagnosis? Prognosis? Outcomes? Economic? Qualitative? Guidelines?
- Build a well–articulated, focused question using the PICO model: ***P***atient, ***I***ntervention, ***C***omparison, ***O***utcome.

Acquire
- What types of evidence and what levels of evidence might exist?
- Where is the evidence likely to be found?
- Select from pre–filtered versus unfiltered resources: systems, syntheses, summaries, synopses, or studies.

Appraise
- Is the information valid? Are the results valid?
- Will the information, if true, make an important difference? What are the results?
- Is the information applicable? How can the results be applied?

Apply
- If valid, will it make a difference to the patient?
- If important, is it relevant?
- If relevant, can it be used?

(JAMAevidence, 2011)

Assess the Patient

- Determine what the issues are
- Prioritize the issues *(The JAMA Network)*
- What if too many questions arise?
  - Patients may have several active problems:
    - possible questions about diagnosis, prognosis, therapy for each problem
    - questions may be too numerous to even ask, let alone answer
  - What is the most important issue for this patient now?
  - Which question, when answered, will help the most?
  - Select the few questions that are most important to answer right away. *(Dawes, 2001)*

Assess the Patient

- Classify the issues:
  - Is this issue a matter of treatment?
  - Is it a matter of whether the treatment is going to hurt my patient?
  - Is it a matter of what is going to happen in the future? Prognosis?
  - Is it a matter of whether I want to implement a clinical policy? Practice Guidelines?
- Knowing the category of the issue leads to the next stage: ***ASKING***

The JAMA Network.
The 5As of the health information cycle: Robert Hayward, MD, defines the 5As of the health information cycle and helps learners understand the process. *JAMAevidence audio* [audio podcast]. Retrieved from https://jamaevidence.mhmedical.com/podcasts.aspx

ASK the Question: Clinical Question Categories

Clinical questions often arise from central issues: *(Straus, 2005)*

- **Diagnosis** the process of identifying a disease or condition. Making the correct diagnosis is the foundation for making decisions on clinical intervention. *(McKibbon, 2009)*
  - *What disease or condition does the patient have?*
- **Therapy** an action or intervention that can potentially improve care or prevent diseases or conditions. *(McKibbon, 2009)*
  - *What is the best treatment for this disease or condition?*
- **Etiology** the cause of a disease, condition or situation. It may also be referred to as harm or causation. *(McKibbon, 2009)*
  - *What is the cause of the patient's disease or condition?*
- **Prognosis** the progression of a treated disease. *(McKibbon, 2009)*
  - *What outcome can be expected from the treatment or intervention used?*

Using PICO to Focus Questions

A clinical question should be directly relevant to the problem. Using the PICO format, the question can be phrased to facilitate searching for a precise answer.

- the **P**atient, population or problem being addressed.
- the **I**ntervention being considered.
- the **C**omparison intervention or exposure, when relevant.
- the clinical **O**utcomes of interest.

Click here to go back to review point quiz

(Washington Health Sciences Libraries, 2009)

ACQUIRE: EBP Tool

- PubMed's Clinical Queries
  - search tool that quickly locates EBP journal articles
  - uses study question categories: therapy, diagnosis, etiology, prognosis
  - includes appropriate study designs

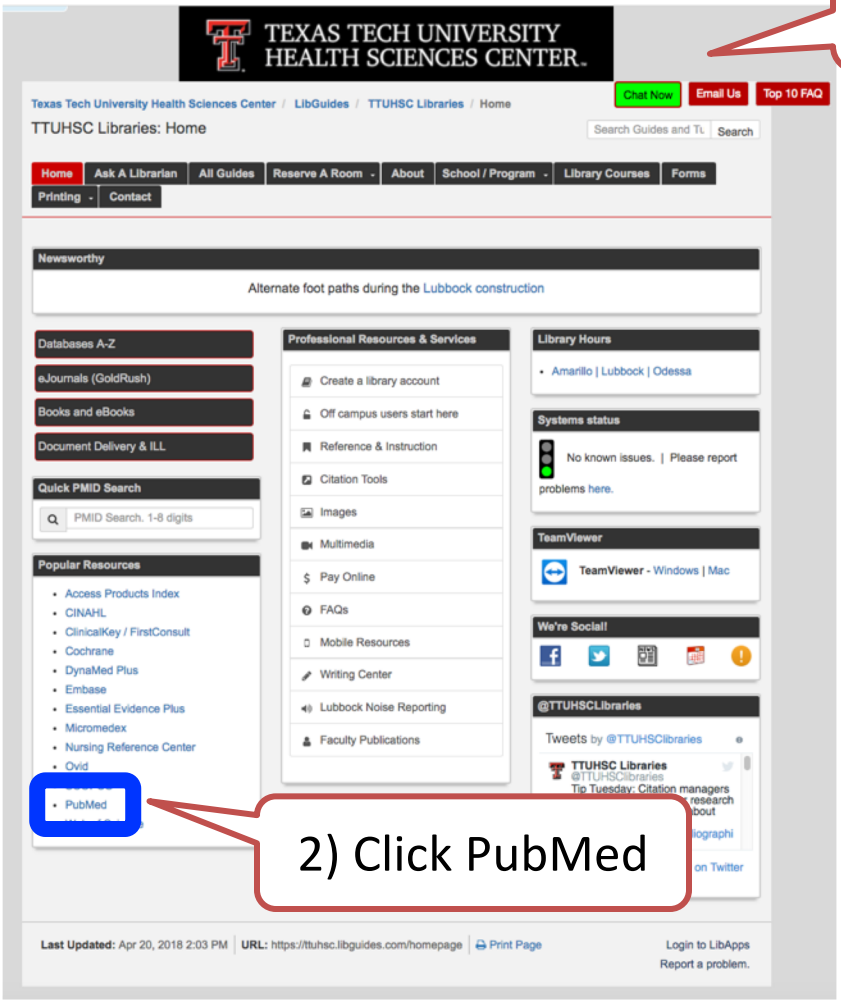
Category	Optimized For	Sensitive/ Specific	PubMed Equivalent
therapy	sensitive/broad	99%/70%	((clinical[Title/Abstract] AND trial[Title/Abstract]) OR clinical trials as topic[MeSH Terms] OR clinical trial[Publication Type] OR random* [Title/Abstract] OR random allocation[MeSH Terms] OR therapeutic use[MeSH Subheading])
	specific/narrow	93%/97%	(randomized controlled trial[Publication Type] OR (randomized[Title/Abstract] AND controlled[Title/Abstract] AND trial[Title/Abstract]))
diagnosis	sensitive/broad	98%/74%	(sensitiv*[Title/Abstract] OR sensitivity and specificity[MeSH Terms] OR diagnose[Title/Abstract] OR diagnosed[Title/Abstract] OR diagnoses[Title/Abstract] OR diagnosing[Title/Abstract] OR diagnosis[Title/Abstract] OR diagnostic[Title/Abstract] OR diagnosis[MeSH:noexp] OR diagnostic * [MeSH:noexp] OR diagnosis,differential[MeSH:noexp] OR diagnosis[Subheading:noexp])
	specific/narrow	64%/98%	(specificity[Title/Abstract])
etiology	sensitive/broad	93%/63%	(risk*[Title/Abstract] OR risk*[MeSH:noexp] OR risk *[MeSH:noexp] OR cohort studies[MeSH Terms] OR group[Text Word] OR groups[Text Word] OR grouped [Text Word])
	specific/narrow	51%/95%	((relative[Title/Abstract] AND risk*[Title/Abstract]) OR (relative risk[Text Word]) OR risks[Text Word] OR cohort studies[MeSH:noexp] OR (cohort[Title/Abstract] AND study[Title/Abstract]) OR (cohort[Title/Abstract] AND studies[Title/Abstract]))
prognosis	sensitive/broad	90%/80%	(incidence[MeSH:noexp] OR mortality[MeSH Terms] OR follow up studies[MeSH:noexp] OR prognos*[Text Word] OR predict*[Text Word] OR course*[Text Word])
	specific/narrow	52%/94%	(prognos*[Title/Abstract] OR (first[Title/Abstract] AND episode[Title/Abstract]) OR cohort[Title/Abstract])
clinical prediction guides	sensitive/broad	96%/79%	(predict*[tiab] OR predictive value of tests[mh] OR score[tiab] OR scores[tiab] OR scoring system[tiab] OR scoring systems[tiab] OR observ* [tiab] OR observer variation[mh])
	specific/narrow	54%/99%	(validation[tiab] OR validate[tiab])

Utilizes pre–formulated strategies to filter to the best evidence

(Haynes, R.B. & et al., 2005)

PubMed's Clinical Queries

1) https://ttuhsc.libguides.com/homepage

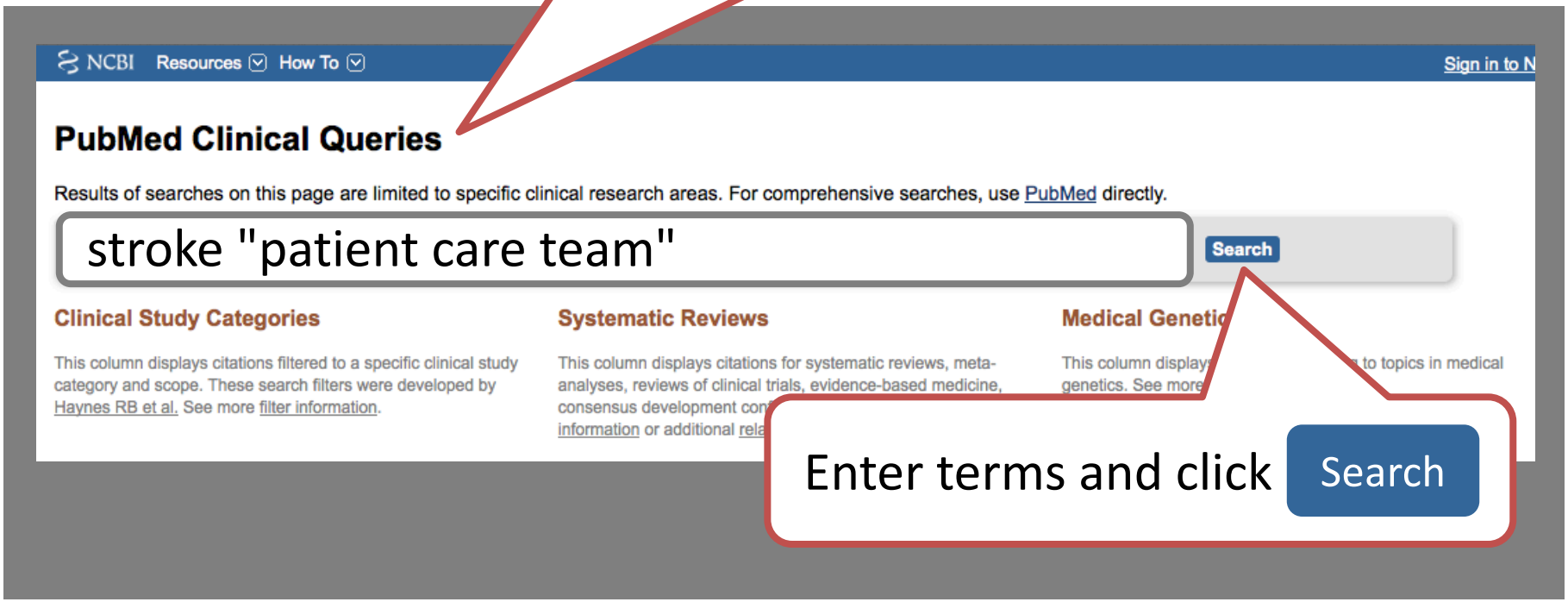


2) Click PubMed

3) Click Clinical Queries

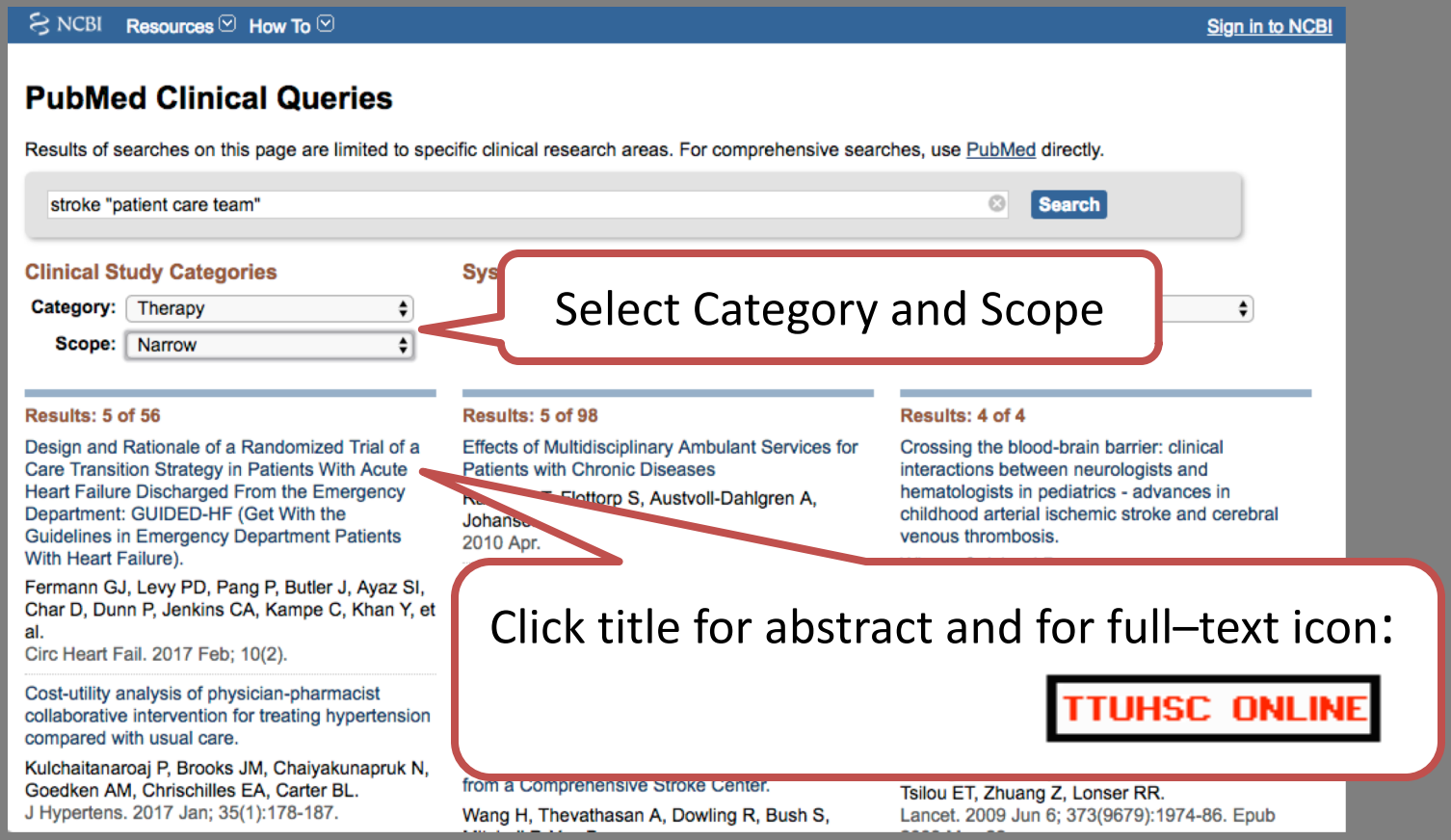
Clinical Queries – Search Process

Clinical Queries provides rapid access to evidence–based journal articles.



Clinical Queries – Question Categories

Clinical Queries defaults to Boolean "AND" when processing the searcher's terms. See pre–formulated strategy on page 10 for specifics on category and scope.



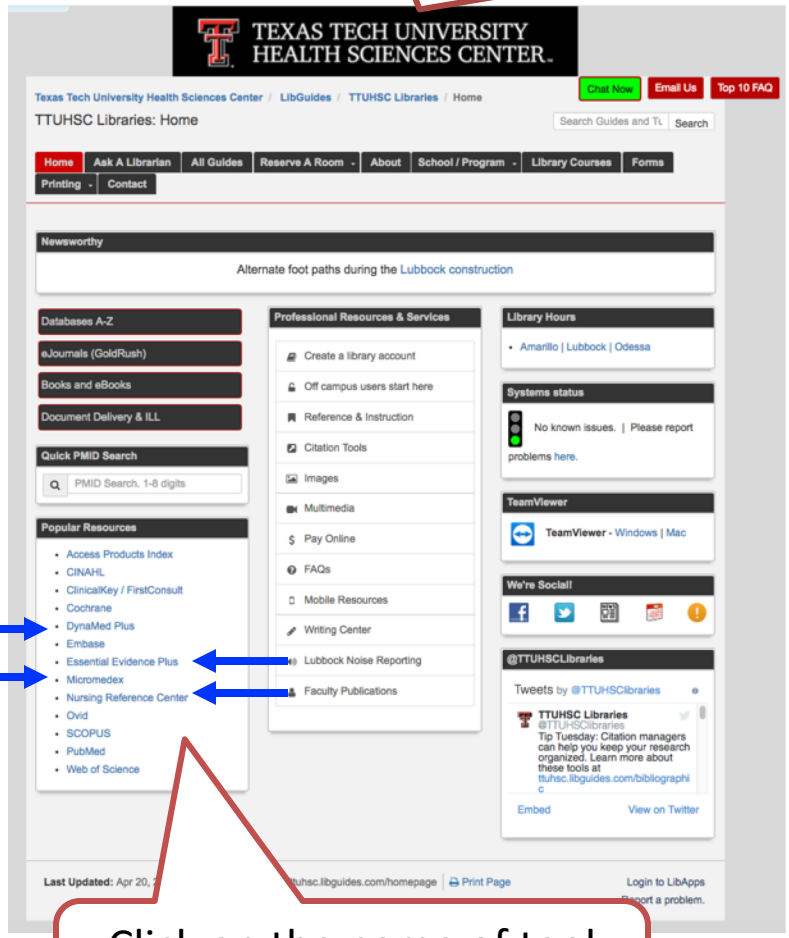
ACQUIRE: Information at Point of Care

- Point–of–Care Systems
  - Contain detailed modules about diseases.
  - Information overviews; rapid electronic updating.
  - Generally includes information on:
    - Etiology
    - Diagnosis
    - Therapy
    - Prognosis
  - Information is rated according to evidence quality level.
  - Available via smartphones for access at patient bedside.

Accessing Point–of–Care Tools

https://ttuhsc.libguides.com/homepage

- TTUHSC Libraries subscribe to these Point–of–Care Databases:
  - * Dynamed Plus™.
  - Essential Evidence Plus©.
  - * FirstConsult™ within Clinical Key.
  - * MICROMEDEX®.
  - # Nursing Reference Center Plus™.
- All of these databases provide web-based mobile access.
  - * also have true mobile apps
  - # app for Androids, iPhones



Click on the name of tool you wish to search

Point–of–Care Tools

ESSENTIAL EVIDENCE PLUS

Browse Our Databases and Interactive Tools Help me choose

- Essential Evidence Topics
- Cochrane Systematic Reviews
- POEMs Research Summaries
- EBMG Guidelines
- Evidence Summaries
- Decision Support Tools
- History and Physical Exam Calculators
- Diagnostic Test Calculators
- Derm Expert Image Viewer
- E/M Coding

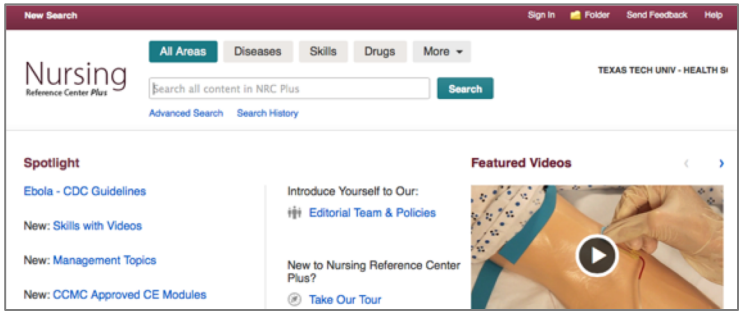
MICROMEDEX®

DynaMed Plus

First Consult/Clinical Overviews

in

Clinical Key®



ACQUIRE: EBP Literature Databases

Access databases below via https://ttuhsc.libguides.com/homepage *under the School/Program pull down or click on Databases A-Z*

- Cochrane Library
  - collection of six databases that contain different types of high-quality, independent evidence to inform healthcare decision-making and are produced the The Cochrane Collaboration *(The Cochrane Collaboration, 2016)*
- Joanna Briggs Institute (JBI). (nursing)
  - includes the JBI Library of Systematic Reviews, Best Practice Information sheets, Evidence Summaries and Evidence-Based Recommended Practice.
- OTseeker
  - abstracts of systematic reviews and randomized controlled trials relevant to occupational therapy. *(Bennett, S., 2003)*
- PED*ro* (physical therapy)
  - abstracts of randomized controlled trials, systematic reviews, and practice guidelines in physiotherapy
  - links to full text articles where possible. *(CEBP, 1999)*

TTUHSC Guides & Tutorials

https://ttuhsc.libguides.com/homepage

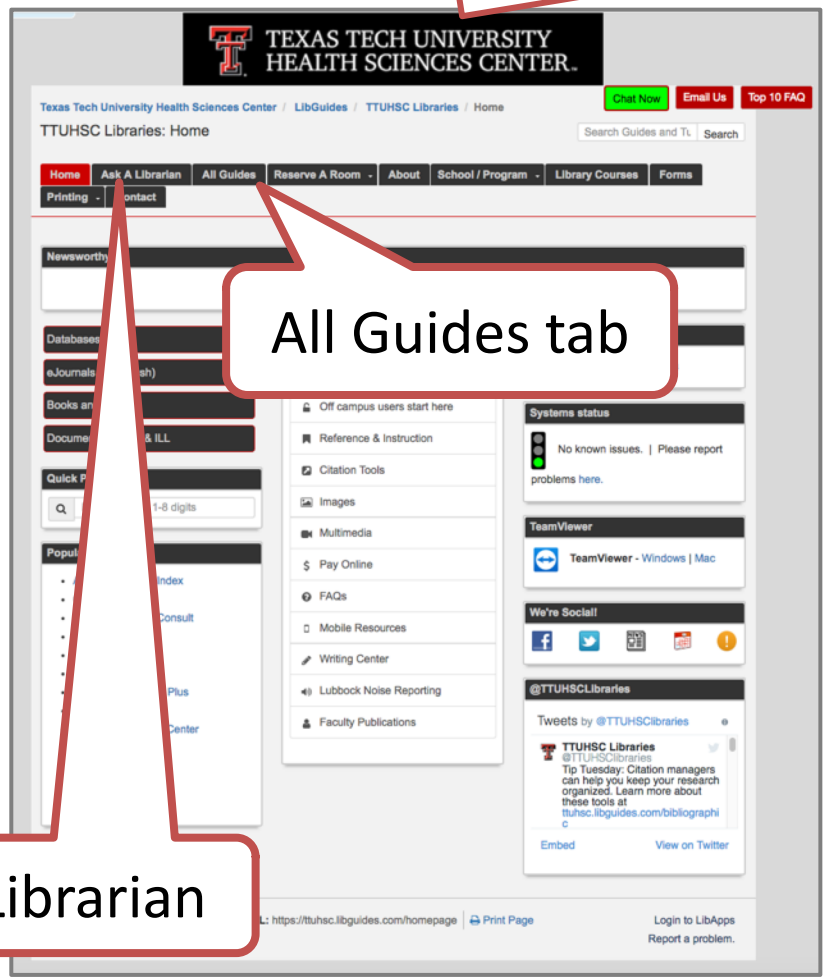
Additional information on:

- PubMed.
- PubMed's Clinical Queries.
- Evidence–Based databases.
- Point–of–Care databases.

By clicking the All Guides tab.

Or contact the library for additional training at:

- "Ask-a-Librarian"



Point-of-Care Producer Tutorial Links

- Click here for links to producer tutorials listed:

  - *After viewing first tutorial, click back arrow to get back to next link!*
  - DynamedPlus™
  - Essential Evidence Plus©
  - Clinical Overviews/First Consult™ (within Clinical Key)
  - MICROMEDEX®
  - Nursing Reference Center™
  - PubMed
  - Rehabilitation Reference Center™

Review point #1

- Your patient is a 45–year–old female just diagnosed with mild hypertension. She does not want to start taking pills and has asked you if she can make other changes that might bring her blood pressure back within normal range.
  - The PICO statement is:
    - P 45–year–old female with mild hypertension.
    - I lifestyle modifications.
    - C medication.
    - O B/P within normal limits.

- Is this PICO statement correctly stated to help you answer your patient's question? Yes or No? To review, click here to go back to pg. 10

Answer #1

- **Yes**. Each element of the scenario is precisely stated. This will help you develop a search strategy that will answer your patient's question.

ACQUIRE: Quality of Evidence

- Study design is important in determining the quality of evidence (Guyatt et al., 2008, p. 998)
- Insufficient attention to quality of evidence risks inappropriate guidelines and recommendations that may lead clinicians to act to the detriment of their patients. (Guyatt et al., 2008, p. 924-925)
- Factors that affect the strength of a recommendation
  - Quality of evidence
  - Uncertainty about the balance between desirable and undesirable effects
  - Uncertainty or variability in values and preferences (of patients)
  - Uncertainty about whether the intervention represents a wise use of resources (Guyatt et al., 2008, p. 926)

Definitions of Study Design

- Case–control study
  - A study that compares people with a specific disease or **outcome** of interest (cases) to people from the same **population** without that disease or outcome (**controls**), and which seeks to find associations between the outcome and prior exposure to particular risk factors. This design is particularly useful where the outcome is rare and past exposure can be reliably measured. Case-control studies are usually **retrospective**, but not always.
- Case series
  - A study reporting observations on a series of individuals, usually all receiving the same **intervention**, with no **control group**.
- Cohort study
  - An **observational study** in which a defined group of people (the cohort) is followed over time. The **outcomes** of people in subsets of this cohort are compared, to examine people who were exposed or not exposed (or exposed at different levels) to a particular **intervention** or other factor of interest. A **prospective** cohort study assembles **participants** and follows them into the future. A **retrospective** (or historical) cohort study identifies subjects from past records and follows them from the time of those records to the present. Because subjects are not allocated by the investigator to different interventions or other exposures, **adjusted analysis** is usually required to minimize the influence of other factors (**confounders**).

Definitions of Study Design continued

- Meta–analysis
  - The use of statistical techniques in a **systematic review** to integrate the results of included studies. Sometimes misused as a synonym for systematic reviews, where the review includes a meta-analysis.
- Prospective study
  - In evaluations of the effects of healthcare **interventions**, a study in which people are identified according to current **risk** status or exposure, and followed forwards through time to observe **outcome**. **Randomized controlled trials** are always prospective studies. **Cohort studies** are commonly either prospective or **retrospective**, whereas **case-control studies** are usually retrospective. In **Epidemiology**, 'prospective study' is sometimes misused as a synonym for cohort study.
- Randomized controlled trial
  - An experiment in which two or more interventions, possibly including a control intervention or no intervention, are compared by being randomly allocated to participants. In most trials one intervention is assigned to each individual but sometimes assignment is to defined groups of individuals (for example, in a household) or interventions are assigned within individuals (for example, in different orders or to different parts of the body).

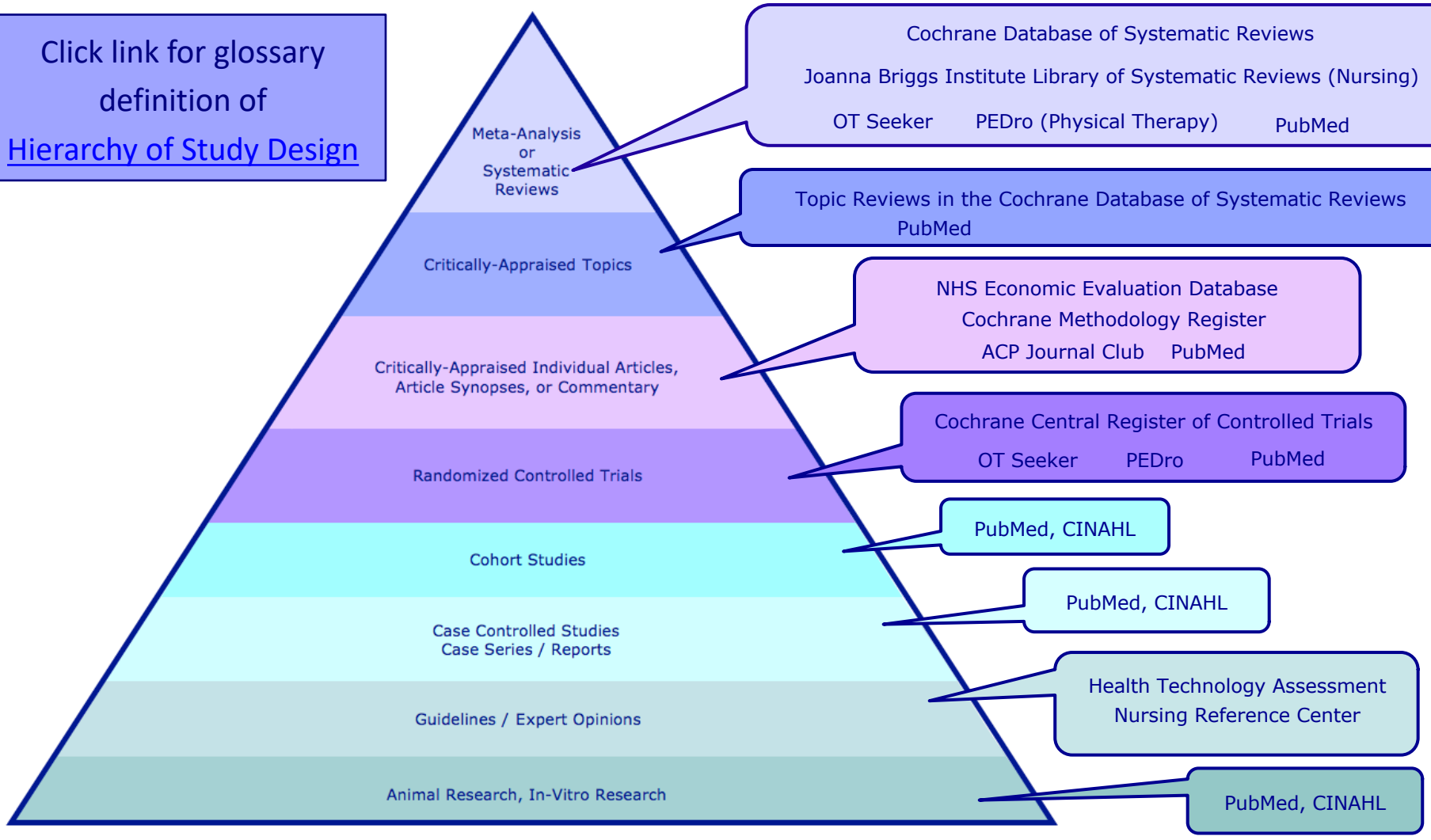
Definitions of Study Design continued

- Retrospective study
  - A study in which the **outcomes** have occurred to the **participants** before the study commenced. **Case-control studies** are usually retrospective, **cohort studies** sometimes are, **randomized controlled trials** never are.
- Systematic Reviews
  - A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyze data from the studies that are included in the review. Statistical methods (**meta-analysis**) may or may not be used to analyze and summarize the results of the included studies.

All definitions from (The Cochrane Collaboration, 2018)

Hierarchy of Study Design & Databases

Click link for glossary definition of Hierarchy of Study Design



(TTUHSC Preston Smith Library, 11/21/2008)

N–of–1 Randomized Controlled Trials

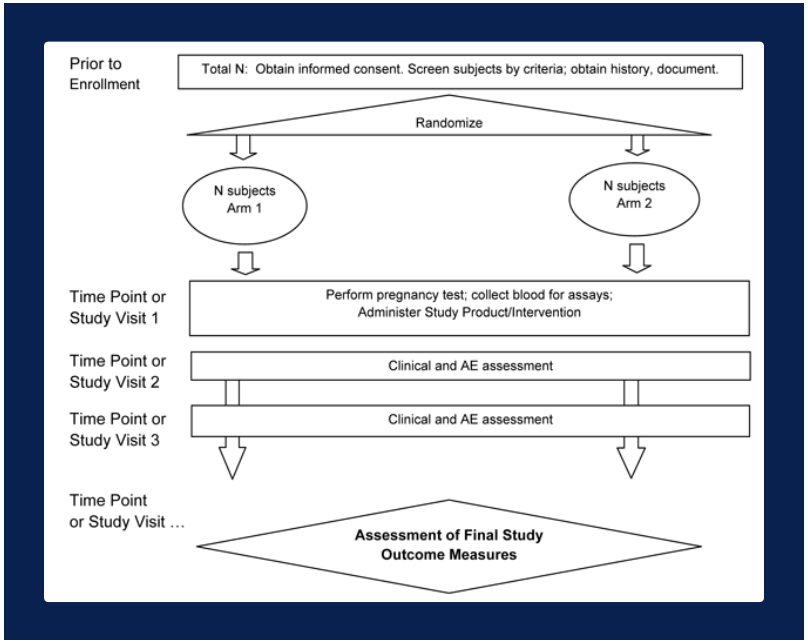
- Experiment designed to
  - determine effect of an intervention/exposure on a single study participant
- In a one N–of–1 design
  - the patient undergoes pairs of treatment periods
  - 1 period involves the use of the experimental treatment
  - 1 period involves the use of an alternate treatment/placebo
  - if possible, patient and clinician are blinded
  - outcomes are monitored
- Treatment periods are replicated
  - until clinician and patient are convinced that
    - treatments are definitely different
    - *or* definitely not different

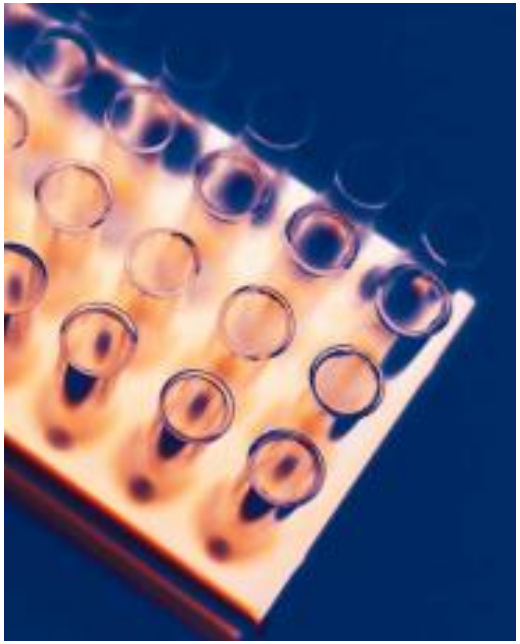
(Guyatt, 2008)

Go back to quiz

Evidence–Based Treatment

"Clinicians should use the results of randomized controlled trials (RCTs) of groups of patients to guide their clinical practice. However, clinicians cannot always rely on the results of RCTs…To determine the best care for an individual patient, clinicians can conduct N–of–1 randomized controlled trials in individual patients." *(Guyatt, 2008)*





Quality of Evidence - GRADE

Grading of Recommendations, Assessment, Development, and Evaluation – GRADE

Code	Quality of Evidence	Definition
A	High	Further research is very **unlikely** to change our confidence in the estimate of effect. • Several high–quality studies with consistent results. • In special cases: one large, high–quality multi–center trial.
B	Moderate	Further research is **likely** to have an important impact on our confidence in the estimate of effect and may change the estimate. • One high–quality study. • Several studies with some limitations.
C	Low	Further research is **very likely** to have an important impact on our confidence in the estimate of effect and is likely to change the estimate. • One or more studies with severe limitations.
D	Very Low	Any estimate of effect is **very uncertain**. • Expert opinion. • No direct research evidence. • One or more studies with severe limitations.

(Essential Evidence Plus EBM Guidelines Editorial Team, 2010)

Hierarchy of Strength of Evidence

Hierarchy of Strength of Evidence for Prevention and Treatment Decisions

- N–of–1 randomized trial
- Systematic reviews of randomized trials
- Single randomized trial
- Systematic review of observational studies addressing patient–important outcomes
- Single observational study addressing patient–important outcomes
- Physiologic studies (studies of blood pressure, cardiac output, exercise capacity, bone density, and so forth)
- Unsystematic clinical observations

(Guyatt, 2008)

Recommendations

- Judgements about evidence and recommendations are complex.
  ("Grading quality of evidence and strength of recommendations," 2004, p. 1)
- *The strength of a recommendation reflects the extent to which we can be confident that desirable effects of an intervention outweigh undesirable effects.* (Guyatt et al., 2008, p. 1049)
- The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach is a system for rating the *quality of evidence* and *strength of recommendations* that is explicit, comprehensive, and increasingly adopted by guideline organizations. The system classifies the confidence in estimates of effect into 1 of 4 levels (high, moderate, low, or very low). Recommendations are graded as strong or weak.
  (In Guyatt, Rennie, Meade, & Cook, 2015, Glossary & American Medical Association, 2015, glossary)

Strength of Recommendation

"Recommendations to administer, or not administer, an intervention, should be based on the tradeoffs between benefits on the one hand, and risks, burdens and, potentially, costs on the other. If benefits outweigh risks and burdens, experts will recommend that clinicians offer a treatment to typical patients. The uncertainty associated with the tradeoff between the benefits and risks and burdens will determine the strength of recommendation."

(GRADE Working Group, 2005)

Strength Of Recommendation Taxonomy (SORT)

Code	Definition
A	Consistent, good–quality patient–oriented evidence *
B	Inconsistent or limited–quality patient–oriented evidence *
C	Consensus, disease–oriented evidence *: usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

**Patient–oriented evidence measures outcomes that matter to patients: morbidity, mortality, symptom improvement, cost reduction, and quality of life.*
Disease–oriented evidence measures: immediate, physiologic, or surrogate end points that may or may not reflect improvements in patient outcomes (e.g. blood pressure, blood chemistry, physiologic function, pathologic findings).

(Essential Evidence Plus EBM Guidelines Editorial Team, 2010)

GRADE: Summary Points

- Guidelines should inform clinicians what the quality of the underlying evidence is and whether recommendations are strong or weak. *(Guyatt, 2008)*

Appraisal: Critical Evaluation Criteria

- The fourth step in the EBP process is to critically appraise the retrieved articles. The three main questions are:
  - Are the results valid? (validity)
    - Did intervention and control groups start with the same prognosis?
    - Was prognostic balance maintained as the study progressed?
    - Were the groups prognostically balanced at the study's completion?
  - What are the results? (reliability)
    - How large was the treatment effect?
    - How precise was the estimate of the treatment effect?
  - How can I apply the results to patient care? (applicability)
    - Were the study patients similar to my population of interest?
    - Were all clinically important outcomes considered?
    - Are the likely treatment benefits worth the potential harm and costs?

(Guyatt, 2008)

Back to Quiz question

Review point #2

- An N–of–1 randomized controlled trial determines the effect of an intervention or exposure on

  a) patients from several cooperating centers

  b) patients in a test group and in a control group

  c) a single study participant

  d) multiple patients

Answer #2

- An N–of–1 randomized controlled trial determines the effect of an intervention or exposure on_____.

- The correct answer is (c) a single study participant
  - For more information: N-of-one study

Review point #3

- Critical evaluation of your retrieved articles is an important part of Evidence–Based Practice. The three main questions you need to ask about the results are:
  - What are the results?
  - Are the results valid?
  - Are the results from a meta–analysis or a systematic review?

  - Yes or No?

Answer #3

- **No**. The third question to ask is:

  How can I apply the results to patient care?

  Even if the research you find has been done well and you feel the results are valid, if it is not applicable to your patient then it is not helpful to you.

  - To refresh your knowledge of: Critical Evaluation

Apply: Integrating EBP with Patient Values

- The fifth step in the EBP process:
  - integrate the patient's values
- Patient preferences
  - Relative values patients place on various health states
  - Determined by values, beliefs, and attitudes patients consider during decision–making (*Guyatt, 2008)*
- Decision making approaches
  - consistent with patient's values:
    - Clinician ascertains preferences, makes decision on behalf of patient.
    - Informed: Physician provides information, patient makes decision.
    - Shared: patient and clinician both bring information/evidence and values/preferences to the decision. (*Guyatt, 2008)*
- Patient Education Tools
  - Reliable, free consumer medical information in *MedlinePlus.gov*
  - Consider patient's literacy and information literacy level.

Low Literacy Skills

- Health literacy is “the degree to which individuals have the capacity to make appropriate health decisions.”
  - Low literacy skills indicate problems with reading, writing, listening, speaking, comprehension and math.
  - Health care professionals must be aware of their patients’ health literacy levels to maximize the effectiveness of their interactions.
  - One way to help patients with low literacy skills is to use visual cues to enhance health education messages.

    (Nielsen–Bohlman, L., 2004)

CDC's Health Literacy Web Site

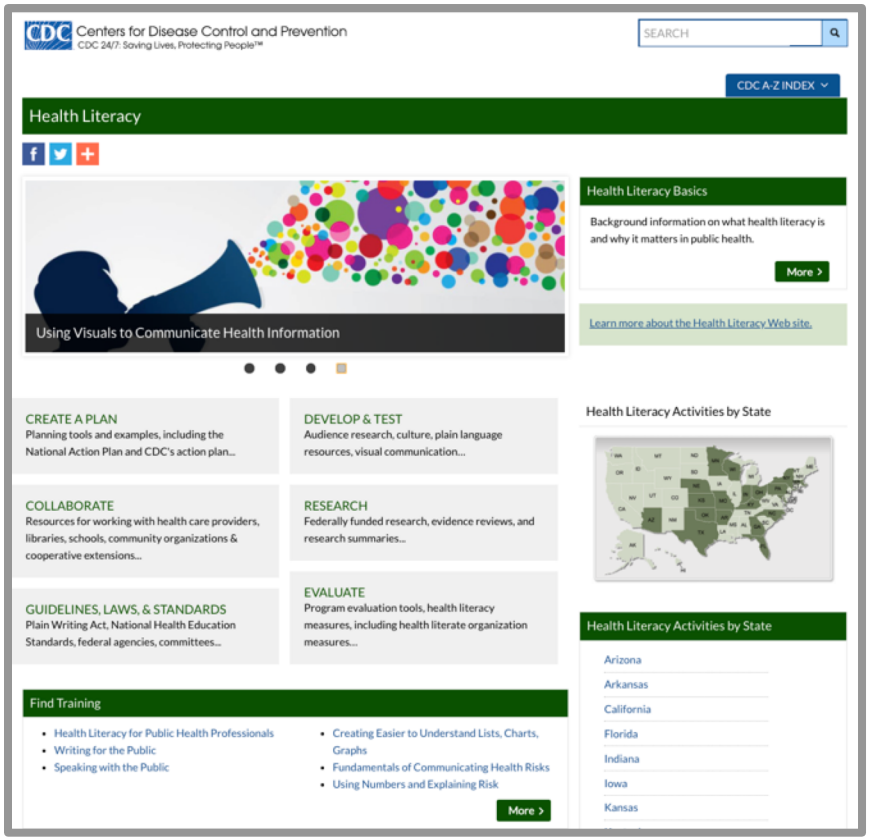
- CDC's Health Literacy site provides
  - information
  - tools
  - links

on health literacy research, practice, and evaluation for public health topics and situations.

(Centers for Disease Control and Prevention, 2017)

Click to link to site

https://www.cdc.gov/healthliteracy/index.html#



MedlinePlus.gov

- *MedlinePlus*®
  - patient education database.
  - authoritative, reliable information.
  - easily understood reading level.
    - Health topics.
    - Drugs, herbals, supplements.
    - Medical dictionary.
    - Medical encyclopedia.
    - Directories.
    - Organizations.
    - Interactive videos.
    - Health information in multiple languages.

(U.S. Department of Health and Human Services, 2016)

Final Points

- Integrating the principles of EBP into your future practice will include:
  - using the five steps of the evidence–based process.
  - building a focused well–articulated clinical question using PICO.
  - using EBP information resources.
  - determining the strength of recommendations, the quality of evidence, and the strength of the evidence.
  - critically appraising the information.
  - integrating the information with the patient's values.

For Future Study

- CEBM, Centre for Evidence Based Medicine. (2016). *CEBM. Website, Centre for Evidence Based Medicine, University of Oxford, Oxford, U.K. http://www.cebm.net*

- Straus, S.E., Richardson, W.S., Glasziou, P., & Haynes, R.B. (2005). *Evidence–based medicine: how to practice and teach EBM*. Edinburgh: Elsevier/Churchill Livingstone.

- The Cochrane library. (2016). *Cochrane Library. http://www.cochranelibrary.com*

- U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2008). *Quick guide to health literacy (2008). Washington, D.C.: U.S. Department of Health and Human Services. Retrieved from https://health.gov/communication/literacy/quickguide/*

Glossary p. 1

- Best research evidence
  - Valid and clinically relevant research, often from the basic sciences of medicine. *(Straus, 2005)*
- Clinical Queries

Provides specialized searches for clinicians. It includes clinical search filters based on research done by R. Brian Haynes, M.D., Ph.D. Five study categories or filters are provided: etiology, diagnosis, therapy, prognosis, and clinical prediction guidelines.

Two scope filters are provided:

Broad/Sensitive search – includes relevant citations but probably less relevant; will retrieve more.

Narrow/Specific search – will get more precise, relevant citations but less retrieval.

(U.S. Department of Health and Human Services, 2016)

Glossary p. 2

- Clinical expertise
  - The ability to use clinical skills and past experience to identify each patient's unique health state and diagnosis rapidly.
    (Straus, 2005)
- Cochrane Collaboration
  - An independent global network... that gathers and summarizes the best evidence from research to help users make informed choices about treatment. They produce the Cochrane Library.
    (The Cochrane Collaboration, 2018)
- Critical appraisal
  - The process of assessing and interpreting evidence by systematically considering its validity, results and relevance.
    (The Cochrane Collaboration, 2018)

Glossary p. 3

- Evidence–based practice (EBP)
  - "Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine requires the integration of individual clinical expertise with the best available external clinical evidence from systematic research and our patient's unique values and circumstances. *(Sackett, 2000)*
  - By clinical expertise we mean the ability to use our clinical skills and past experience to rapidly identify each patient's unique health state and diagnosis, their individual risks and benefits of potential interventions, and their personal circumstances and expectations.
  - By patient values we mean the unique preferences, concerns and expectations each patient brings to a clinical encounter and which must be integrated into clinical decisions if they are to serve the patient. By patient circumstances we mean their individual clinical state and the clinical setting." *(Straus, 2005)*

Glossary p. 4

- GRADE
  - Grading of Recommendations, Assessment, Development, and Evaluation *(GRADE Working Group, 2005)*
- Hierarchy of Study Designs
  - A system of classifying and organizing types of evidence, typically for questions of treatment and prevention. Clinicians should look for the evidence from the highest position in the hierarchy. *(Guyatt, 2008)*

Glossary p. 5

- Patient circumstances and unique values
  - Circumstances: Their individual clinical state and the clinical setting.
  - Values: The unique preferences, concerns, and expectations each patient brings to a clinical encounter. *(Straus, 2005)*
- PICO
  - A method for answering clinical questions. *(Guyatt, 2008)*
- Quality of Evidence
  - Can be categorized as high, moderate, low, or very low.

    (GRADE Working Group, 2005)

Glossary p. 6

- Strength of Recommendation Taxonomy (SORT)
  - Addresses the quality, quantity, and consistency of evidence and allows authors to rate individual studies or bodies of evidence. The taxonomy is built around the information mastery framework, which emphasizes the use of patient–oriented outcomes that measure changes in morbidity or mortality.
    - A–level recommendation is based on consistent and good–quality patient–oriented evidence.
    - B–level recommendation is based on inconsistent or limited–quality patient–oriented evidence.
    - C–level recommendation is based on consensus, usual practice, opinion, disease–oriented evidence, or case series for studies of diagnosis, treatment, prevention, or screening. *(Ebell, & et al., 2004)*

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