



Best Evidence = Best Practice

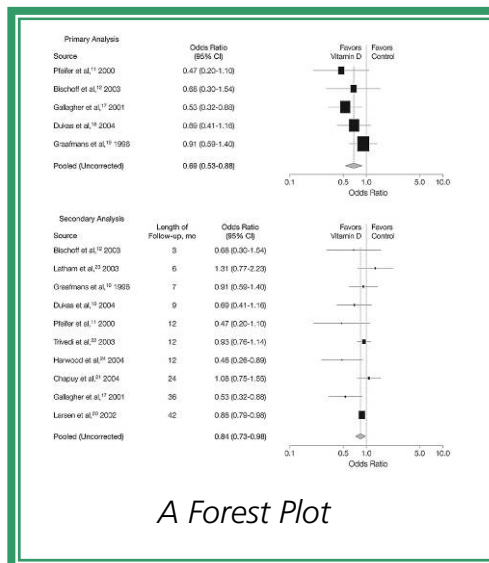
Introduction to the Evidence-Base

The Literature

When looking for **best evidence**, you must be able to **know it when you see it** (in fact, this WILL be on the test!). Below are types of literature that contain best evidence. After a while, you will become familiar enough with each of these so you will recognize them right away and will easily know how to **appraise** and **apply** what you have found. Throughout the year, you will learn how to and will also be asked to identify ways to find these types of Evidence-Based Medicine (EBM) resources in the medical literature.

Systematic Reviews – Considered to be the strongest evidence available. *Systematic Reviews* are articles that contain **explicit rules** for selecting the studies to be included in the review. These rules guide the authors as to what findings they can and can NOT include in the review, thereby lessening the probability that bias will influence the conclusions. A structured format is used for consistent presentation of information and data. *WHERE TO FIND: Cochrane Database of Systematic Reviews, Database of Reviews of Effectiveness (DARE), PubMed, using the “Clinical Queries Systematic Reviews” filter*

MetaAnalysis – A sub-class of the Systematic Review. *Meta-Analysis* combine and summarize the numerical data in a Systematic Review when the results are statistically similar. They are often presented graphically in a forest plot. *WHERE TO FIND: Certain Systematic Reviews (from Cochrane or MEDLINE) where pooled results are statistically similar.*



Critically Appraised Evidence Syntheses – An article, most often from a dedicated database, that will review ALL evidence on a certain topic. *WHERE TO FIND: DynaMed*

Critically Appraised Article Summaries – A summary review, often in structured abstract style, that focuses on evidence from a journal article in the primary literature. *WHERE TO FIND: ACP Journal Club*

Randomized Controlled Trials – A clinical trial that uses at least one control group and one placebo/comparison group. Some RCT's are better than others. When reviewing an RCT, look at the population studied and how it compares to your patient. Also look at the number of participants in the study. A study with 1,000 participants will probably produce a better outcome than a study with only 10 participants. *WHERE TO FIND: PubMed, using the "Clinical Queries Clinical Studies" filter.*

Cohort Studies - Prospective studies looking at a disease-free population over a period of time. A classic example is the Framingham Heart Study, now in its 60th year. *WHERE TO FIND: In PubMed/MEDLINE – use a search term followed by **AND cohort studies***

Case-Control Studies - Retrospective studies that look at a series of patients and match them against controls to identify potential exposures and outcomes. Many of the etiological studies that determined the dangers of smoking were Case-Control studies. *WHERE TO FIND: In PubMed/MEDLINE – use a search term followed by **AND case-control studies***

Case Reports – A clinical presentation of a small set of patients often describing unusual patient presentations or observed adverse reactions to treatments. They are considered weak in evidence as they do NOT constitute a large study population but ARE important as a tool to communicate unique findings. *WHERE TO FIND: PubMed/MEDLINE*

Review Articles - Like systematic reviews, review articles will explore the body of medical literature over a certain time frame (i.e., ten years) and will present summary findings. Unlike systematic reviews, review articles often include the author's recommendations which can lead to bias. *WHERE TO FIND: PubMed/MEDLINE, eMedicine, UpToDate*



The Resources

After you PICO a case, you are then ready to begin a search for evidence, looking for examples of the types of literature listed above. Use the resources on these next few pages **in the order they appear below**. The top resources have **less** overall material in them than do the ones below. However, if you find something in one of the **top** resources, you are looking at **the strongest evidence available**. Use this list as you might a ladder. Start on the top rung and if you don't find something there, move down a rung and try again.

Cochrane Database of Systematic Reviews - A collection of structured systematic reviews and protocols (which are systematic reviews in process). Usually lengthy but very detailed and rich with information. Often include meta-analysis in the form of visual "forest plots"

- **ACCESS** – via the OVID suite of databases
- **STRENGTH** – Least amount of bias=highest level of evidence
- **WEAKNESS** – a very small portion of the medical literature. Only appx 5,000 published to date.
- **SEARCH TIP** – Use "field tags" and "wild cards" (.ti and \$) for better relevance (i.e., steroid\$.ti will find *steroid* or *steroids* in the *title* of the review)

DynaMed – Evidence-Based clinical review summaries. DynaMed monitors the medical literature for best evidence and creates daily updates to its knowledge base. Bullet-point summaries point to best diagnostic, therapeutic and prognostic evidence.

- **ACCESS** – via the library home page (left "quick link" bar)
- **STRENGTH** – Best evidence-based syntheses available
- **WEAKNESS** – entries in short bullet-point format. Good for assessing quick evidence but less helpful for broader overview.
- **SEARCH TIP** – Solid subject or category browsing

DARE (Database of Abstracts of Reviews of Effects) – Abstracts of non-Cochrane systematic reviews.

- **ACCESS** – via the OVID suite of databases
- **STRENGTH** – Systematic Reviews can be found in sources besides Cochrane. DARE is a great way to find other strong evidence in the literature
- **WEAKNESS** – systematic evidence is NOT updated as in Cochrane or DynaMed.
- **SEARCH TIP** – Use Cochrane search tips

ACP Journal Club – Abstracts of articles containing strong evidence from within the primary literature.

- **ACCESS** – via the OVID suite of databases
- **STRENGTH** – an easy way to find good evidence from within the primary medical literature
- **WEAKNESS** – material is NOT updated – always check the date when the abstracted article was initially published. And, not ALL good primary evidence-based literature is included.
- **SEARCH TIP** – Use Cochrane search tips

PubMed Clinical Queries – PubMed/MEDLINE search feature that filters results in order to display only articles backed by good evidence.

- **ACCESS** – via the library home page (left “quick link” bar) – by entering PubMed this way, you will get access to full-text material when available.
- **STRENGTH** – MEDLINE is simply the most powerful biomedical database on earth
- **WEAKNESS** – MEDLINE is enormous – over 17 million citations to date. Unless you search carefully, you can become quickly overwhelmed.
- **SEARCH TIP** – Start with two or three terms MAXIMUM. Separate your terms using the AND or OR operators (AND to narrow, OR to broaden). Don’t worry about field tags as with Cochrane - let PubMed’s powerful “mapping” feature go to work for you. Remember to choose your evidence category based on the type of question you are asking (diagnostic, therapeutic, etc.)

National Guideline Clearinghouse – Collection of guidelines from the federal government (National Institutes of Health) and professional medical societies.

- **ACCESS** – www.guidelines.gov
- **STRENGTH** – comprehensive guidelines from mostly non-profit entities.
- **WEAKNESS** – Many but not ALL include graded evidence. Also consider bias inherent in, for example, recommendations from an internal medicine society (possibly non-invasive) versus those from a surgical society (possibly invasive) both of which may be backed up with their own evidence-based outcome data.
- **SEARCH TIP** – Use the “detailed search” feature drop-down boxes to make choices (particularly the “guideline category”) to focus your search.

Background Materials – If you have come this far down the list, you have probably not discovered good evidence on your topic. Don’t be surprised as there are still many areas in medicine, especially in rare or complex cases, where good evidence just does not exist. Background sources such as eMedicine, UpToDate, eBooks and good-old printed text books can be excellent. When using them, just keep in the back of your mind the question of who is writing the material, what biases they might be bringing to the material and how your patient is either like or unlike the population being observed in the book.

The Definitions

Like many areas within the discipline of medicine, EBM has a language all its own. Many terms you will recognize from your epidemiology course – others may be new to you.

SOME TERMS FOUND IN DIAGNOSIS/TESTING

- **Sensitivity**
 - Percent of a population **with** a disease that will test **positive**
- **Specificity**
 - Percent of a population **without** a disease that will test **negative**
- **Positive Predictive Value (PPV)**
 - Percentage of **positive** test results that are indeed **positive**
- **Negative Predictive Value (NPV)**
 - Percentage of **negative** test results that are indeed **negative**

SOME TERMS FOUND IN TREATMENT/THERAPY

- **Absolute Risk (AR)**
 - Percent of population in a study in an **intervention** or **control** group that reach a certain outcome.
- **Absolute Risk Reduction (ARR)**
 - The difference between the absolute risk in an intervention group versus a control group
- **Relative Risk (RR)**
 - Number of times more or less than 1 that an event will occur in one group vs. another.
 - <1 = reduced risk
 - >1 = increased risk
- **Relative Risk Reduction (RRR)**
 - The proportional reduction in an outcome rate between an intervention group and a control group
 - Often used to **inflate** outcomes
 - **NOT** the same as *Relative Risk!*

- **Number Needed to Treat (NNT)**
 - Number of patients that need to be treated to achieve one favorable outcome
- **Number Needed to Harm (NNH)**
 - Number of patients that need to be treated before an adverse effect occurs

Where Will You See EBM This Year?

In Family Medicine:

Where you will review creating a PICO from a clinical case of your choosing and will practice searching for best-evidence in the Lamar Soutter Library Computer Training Lab. You will also learn how to interpret and calculate therapy statistics and recognize types of bias inherent in the medical literature.

In Pediatrics:

Where you will use best-evidence in a prevention-oriented exercise describing the effectiveness of a screening activity or intervention.

In Psychiatry:

Where you will review harm in the literature, statistical versus clinical significance of outcomes data and the role that the placebo effect can play within a clinical trial.

In Internal Medicine:

Where you will discuss the influence of the pharmaceutical industry on clinical research and physician prescribing activities.