AIHA Learning Resource Center Project

Evidence-Based Practice
Guidelines, Workplan, and Reference Manual

Spring 2004

Contents of This Manual:

Section 1 – AIHA Evidence-Based Practice Implementation Guidelines and Workplan

Introduction and Overview

AIHA establishes Learning Resource Centers (LRCs) at health care institutions in order to improve health professionals' access to the most current health and medical information and to encourage the greater use of research evidence to inform clinical practice, education, and health care policy. This manual includes guidelines and reference materials for the staff of a LRC located within a health care institution who are responsible for promoting the use and understanding of research evidence by health professionals, educators, and policy-makers within the institution.

Please note that this manual will be updated periodically with additional resources as they become available. If you are reading a printed version of this manual, please check periodically under the Learning Resource Center program section of the AIHA Web site (www.aiha.com) to check for the latest edition.

EBP Implementation Guidelines / Workplan

The following list of steps are intended to serve as guidelines for LRC staff and others seeking to promote evidence-based practice within an institution or community.

Step 1 – Identify an EBP Specialist / Review List of Responsibilities

AIHA recommends the designation of a staff person to serve as an "Evidence-based Practice (EBP) Specialist." The suggested qualifications and responsibilities for the EBP Specialist are listed below. (Note: a more complete description of the listed responsibilities will be provided in later steps.)

Responsiblities:

1. Advocate the use of evidence-based practice among local health professionals, including periodic presentations on the general principles of evidence-based practice as well as presentations on the latest research evidence on specific topics of interest to institutional staff and/or local health professionals.
2. Provide training to staff and other local healthcare professionals on the foundations of evidence-based practice, medical searching techniques, and critical appraisal skills.
3. Improve the ability of other staff to evaluate health and medical information resources and determine how this information can be applied in day-to-day practice.
4. Facilitate working groups of health professionals to periodically review various clinical practices, educational methodologies, or health policies. (LRCs are asked to use a standard template called a Practice Standard Review, which is included later in this manual.
5. Complete an annual Institutional Evidence-based Practice Survey to help assess the current environment at your institution for evaluating and reviewing standards of practice.
6. Assist LRC staff in providing information support to LRC users (searching for and reviewing information sources).

7. Assist LRC staff in keeping LRC open, providing training, and other responsibilities, as desired (optional).
8. Participate in periodic AIHA training workshops and conferences, including the delivery of presentations.

Desired Qualifications:

1. Formal background in health or medicine
2. Familiarity with the principles of evidence-based practice
3. Knowledge of computers and the Internet, including medical Internet and database searching techniques
4. Can devote 1-5 hours per week to performing the above-listed responsibilities.

Step 2 – Become Familiar with the Fundamentals of Evidence-based Practice, Critical Appraisal, and Information Search Methodologies

In addition to the periodic training workshops that AIHA provides for AIHA partner institutions, AIHA supplies LRCs with a number of educational resources and reference materials to help LRC staff educate themselves on the core set of skills they need in order to fulfill their responsibilities.

This core set of skills includes:

- Fundamentals of evidence-based practice – an overview of the principles of EBP and the process for applying an evidence-based approach to answer clinical, educational, and policy questions
- Critical appraisal – including the definitions of terms commonly used in research articles and an understanding of how to read and assess the validity of different types of research
- Literature Search Methodologies – including an understanding of how to conduct a search for information and a knowledge of key sources of evidence-based information

AIHA provides LRCs with the following set of educational resources relevant to these topics:

- *Users' Guides to the Medical Literature: Essentials of Evidence-based Clinical Practice*, by Guyatt and Rennie (in English and Russian) – This useful guidebook provides an introduction to EBM for health professionals. Part 1 includes a curriculum for a short course on how to use medical literature. Part 2 is intended for those involved in teaching EBM or who simply want to gain a deeper understanding of the subject.

- Evidence-*based Medicine: How to Practice and Teach EBM*, by David Sackett, et al. (in English) – This book, which focuses more on tactics and clinical applications than theory, aims to serve as a very practical and easy-to-use guide for clinicians at any stage of their training or career who want to learn how to practice or teach EBM.

- *Clinical Epidemiology: The Essentials*, by Fletcher, Fletcher and Wagner (in English and Russian) – "Clinical epidemiology" is defined by this book's authors as the science of making predictions about individual patients by counting clinical events in similar patients, using strong scientific methods for studies of groups of patients to

ensure that the predictions are accurate. The book, is written "for clinicians who wish to develop a systematic understanding of how the evidence base for patient care is developed and assessed…[and] to foster methods of clinical observation and interpretation that lead to valid conclusions."

- *Introduction to Evidence-based Medicine,* by V.V. Vlasov (in Russian) – This book provides a general overview of EBM principles, describes types of research design, information sources, and information search strategies.

For anyone who does not have access to the above-listed resources, there are a wide number of resources available for free on-line, some of which are included in this manual:

Fundamentals of Evidence-based Practice

- Evidence-Based Health Care – The Five Steps (Section 2) – A brief overview of the principles of EBP, presented in the format of a five-step process for finding and using evidence.
- Glossary of EBM Terms (Section 3) – Covers basic EBP concepts and definitions
- Evidence about Clinical Effectiveness (Section 4) – Includes a guide to the different types of evidence about clinical effectiveness and the relative strengths of each.
- The Evidence Pyramid (Section 5) – A chart illustrating the clinical relevance of different types and sources of evidence.
- Clarifying the Problem Using PICO (Section 6) – Overview of the PICO methodology for clarifying the type of question or problem for which you are seeking evidence.

Critical Appraisal

- Glossary of EBM Terms (Section 2) – Provides definitions of statistical terms frequently used in research articles and other sources of evidence
- Critical Appraisal of Articles (Section 7) – A set of worksheets for helping to review different types of research articles.
- Practice Standard Review (Section 8)

Literature Evidence Search Methodologies

- Glossary of MEDLINE Terms (Section 9) – A helpful reference for using one of the world's largest searchable indices of the medical literature
- MEDLINE Search Strategies (Section 10) – Tips for improving the quality of information resources found when conducting MEDLINE searches.
- Four Types of Questions and Search Strategies (Section 11) – Guidelines and useful tips for finding relevant information sources based on the different types of clinical questions you are asking.
- The Cochrane Library Training Materials (Section 12) – The Cochrane Library is one of the premier sources of evidence on clinical effectiveness. This guide provides an overview of the Cochrane Library's resources and tips for how to use them. (Note: The Cochrane Library is provided by AIHA to LRCs on CD-ROM, but may also be available on-line for free to non-AIHA-partner institutions

through other sources, including WHO. For a list of some of these possible sources, see Section 13, A Guide to Electronic Libraries.)

In addition to these resources, Section 14 of this manual includes a list of EBP-related Web sites and other resources, which provide educational guidance as well as sources of evidence-based information.

EBP Distance Learning Course

Finally, AIHA has also begun providing an e-mail-based distance learning module on EBP, which covers all of the above-mentioned skills and topics. This course is open to anyone wishing to participate, including LRC staff, other AIHA partner institutions, and anyone else interested in learning about EBP. To participate in the next free course, please contact Irina Ibraghimova, AIHA Health Information Resources Coordinator, at ibra@zadar.net.

Step 3 – Provide Training and Outreach to Health Professionals

Generally speaking, the task of the EBP Specialist is to actively promote a greater understanding of the principles of evidence-based practice so that staff at the institution are able to integrate evidence into their day-to-day practice. Here are some of the ways that an EBP Specialist can achieve this goal:

- Organize periodic **educational lectures or training sessions** on the concepts of evidence-based practice, critical appraisal, and literature search methodologies. Presentations and training sessions should aim to provide the audience with practical knowledge that they can apply on their own. Training sessions can be organized into any length of time—for example, as a one- or two-hour course offered periodically for interested staff, or as a one-day course mandatory for all clinical staff. The EBP Specialist may want to coordinate with the administration at his or her institution to discuss how training sessions can be best organized to reach the majority of health professionals (or educators or students) at the institution. Medical universities may want to consider incorporating an EBP component as part of their standard medical curricula, if it is not already covered.
- Prepare easy-to-use reference guides that can be given to staff as **handouts**. These might include tips for using MEDLINE for searching, a list of key EBP Web sites with sources of EBP information, or worksheets for appraising a research article. You may choose to use some of the information materials included in this manual. Handouts should be as short as possible (ideally just one page) so that staff will be more likely to carry them around in their pocket during the workday.
- Identify topics that are relevant or interesting to a wide number of health professionals in your institution and conduct a literature search. Then post or provide printed copies of an **evidence report** on this topic for appropriate staff of your institution. The evidence report can be designed in a number of different ways: (a) as a list of the latest research articles with links to the Web sites where these can be found, (b) as a compilation of abstracts from these research articles, (c) as a summary of the latest findings, (d) or any other format that you wish to develop on your own.
- Set up **e-mail distribution lists** among health professionals at your institution to disseminate information about new EBP resources. An e-mail list will also help you

to regularly remind staff about the general idea of EBP and may prompt them to seek out new evidence more often.

Step 4 – Support Integration of Evidence into Practice

The ultimate goal and challenge for the EBP Specialist is to find ways to encourage health professionals to seek out evidence and apply it to their practice. As part of the LRC Project, AIHA has tried to develop mechanisms to help LRCs to engage staff in thinking about how evidence relates to practice. One of these mechanisms is the **Practice Standard Review** (see Section 8). AIHA asks LRC staff to form a working group of various health professionals at the institution to identify a practice (a clinical intervention, a health care policy or program, an educational method, or any other activity associated with the work of their institutions) and then search for the latest research evidence about that practice. The Practice Standard Review template then guides members of the working group through a series of questions to help them critically appraise the evidence they have found and draw conclusions about what the evidence says about the current practice standards at the institution. In this way, the Practice Standard Review not only directly supports improvement in practice, but also helps to involve health professionals in the critical appraisal process, which they can then independently apply to other questions and problems that arise in their day-to-day work.

On a broader level, it is useful for the EBP Specialist to **identify existing quality control and quality improvement systems and processes** within his or her institution and then think about ways that these might be improved. For example, if a hospital has a committee to review clinical outcomes or guidelines or a medical university has a curricula review committee, the EBP Specialist can try to become involved in this committee and ensure that the lessons of EBP are being applied and that the latest evidence is available to the committee. Similarly, for institutions engaged in health policy development, the EBP Specialist can seek to provide support at meetings where policies are being discussed. AIHA has developed an **Institutional EBP Survey** (see Section 15-b), which EBP Specialists can use to help identify existing institutional mechanisms for quality control, guideline development, and monitoring of clinical effectiveness.

Conclusion

The activities discussed in each of the four steps outlined above represent a wide range of ideas that institutions can implement to support the integration of research evidence into clinical practice, education, and health care policy. However, this list of activities is by no means exhaustive. Just as health professionals need to consider local conditions and individual patient preferences when choosing a treatment approach, EBP Specialists need to think about their local and institutional contexts and adapt these ideas (or come up with entirely new ones) that will work for them. As noted at the beginning of this document, AIHA will be periodically updating the materials and information included in this manual with new ideas and resources recommended by our partners and other groups and individuals around the world. We encourage you to share your ideas and experiences with us and with others who are engaged in similar work by communicating through the LRC Network mailing list (lrc-network@mail.aiha.com). If you are not already on this mailing list and would like to join, please contact Mark Storey, AIHA Program Officer, (mstorey@igc.org), and provide your institutional affiliation and interests.

Section 2 – Evidence-Based Health Care – The Five Steps

The practice of Evidence-Based Health Care (EBHC) comprises the following 5 steps –

Step1 – Converting the need for information into an answerable question

A clearly-formulated question is essential to the process. Defining the question helps to clarify in your own mind the problem and the information you will need to solve it and helps to define the kind of evidence you will need to answer it. Wording the question carefully should give you terms that will help you to search more effectively. As a result, you will be more likely to find evidence that will be relevant and appropriate to your patient's or client's care.

Step 2 - Tracking down the best evidence with which to answer that question

This includes identifying relevant sources of evidence and working out an appropriate search strategy

Step 3 – Critically appraising that evidence for its validity , impact (size of the effect), and applicability

Evidence can come in many forms (from large multi-center randomized controlled trials to small studies of the experience of being cared for or of being treated). Specific approaches to appraising the quality of evidence vary, but whatever the evidence, you need to decide three things: whether you can trust the results, what the results mean, and whether they are relevant to your practice.

- VALIDITY – This usually applies to the "closeness to the truth" of the study DESIGN. Any experimental research study has the potential to "interfere" with the setting in which it is conducted. The question you must ask is: "Has the study interfered with the setting to the extent that we can no longer believe that it represents an accurate picture of the "real world"?

- RELIABILITY – This usually applies to the "trustworthiness" of the study RESULTS. The question you ask here is: "How confident can we be that the results shown here are indeed reliable? What is the likelihood that this is a "chance result"? How strong is the possibility that the same result would be obtained were we to repeat the study over and over again?"

- APPLICABILITY – This concerns the likelihood that we can use the IMPLICATIONS of this study within our own setting. The burden of proof is with us: "Is their any reason to suppose that the findings of this study would not occur in my own setting? In what way(s) does my setting differ from that studied in the research article?"

Step 4 - Integrating the critical appraisal with your clinical expertise and patients unique biology, values and circumstances to carry on a decision and implement the evidence in your practice

The following tools can be used to introduce sound research evidence into day-to-day practice

- building alliances (bringing people together to create a shared sense of purpose)
- using change agents (recruiting key people who are well respected and whose views are likely to be listened to)
- disseminating information (leaflets, guidelines, media)
- providing education and training
- supporting practice (developing care pathways, structured notes, checklists, use of audit and review)

Step 5 – Evaluating the effectiveness and efficiency in executing steps1-4 with a view to improve the next EBHC cycle

There are two aspects to evaluating your performance. First you need to evaluate whether the change that you have made has had the anticipated impact. Second you need to evaluate how you have benefited from undertaking the evidence-based process.

Section 3 – Glossary of EBM Terms

(from Clinical Evidence –Glossary
http://www.clinicalevidence.com/lpBinCE/lpext.dll?f=templates&fn=main-h.htm&2.0
Glossary of EBM Terms
http://www.cebm.utoronto.ca/glossary/)

Absolute risk (AR) The probability that an individual will experience the specified outcome during a specified period. It lies in the range 0 to 1, or is expressed as a percentage. In contrast to common usage, the word "risk" may refer to adverse events (such as myocardial infarction) or desirable events (such as cure).

Absolute risk increase (ARI) The absolute difference in risk between the experimental and control groups in a trial. It is used when the risk in the experimental group exceeds the risk in the control group, and is calculated by subtracting the AR in the control group from the AR in the experimental group. This figure does not give any idea of the proportional increase between the two groups: for this, relative risk (RR) is needed (see below).

Absolute risk reduction (ARR) The absolute difference in risk between the experimental and control groups in a trial. It is used when the risk in the control group exceeds the risk in the experimental group, and is calculated by subtracting the AR in the experimental group from the AR in the control group. This figure does not give any idea of the proportional reduction between the two groups: for this, relative risk (RR) is needed (see below).

Applicability The application of the results from clinical trials to individual people. A randomized trial only provides direct evidence of causality within that specific trial. It takes an additional logical step to apply this result to a specific individual. Individual characteristics will affect the outcome for this person.

Bias Systematic deviation of study results from the true results, because of the way(s) in which the study is conducted.

Blinding/blinded A trial is fully blinded if all the people involved are unaware of the treatment group to which trial participants are allocated until after the interpretation of results. This includes trial participants and everyone involved in administering treatment or recording trial results. Ideally, a trial should test whether people are aware of which group they have been allocated to. This is particularly important if, for example, one of the treatments has a distinctive taste or adverse effects. Unfortunately such testing is rare. The terms single and double blind are common in the literature but are not used consistently.

Case control study A study design that examines a group of people who have experienced an event (usually an adverse event) and a group of people who have not experienced the same event, and looks at how exposure to suspect (usually noxious) agents differed between the two groups. This type of study design is most useful for trying to ascertain the cause of rare events, such as rare cancers. Case control studies can only generate

odds ratios (OR) and not relative risk (RR). Case control studies provide weaker evidence than cohort studies but are more reliable than case series.

Case series Analysis of series of people with the disease (there is no comparison group in case series). Case series provide weaker evidence than case control studies.

Clinical Practice Guideline A systematically developed statement designed to assist clinician and patient decisions about appropriate health care for specific clinical circumstances

Clinically significant A finding that is clinically important. Here, "significant" takes its every
day meaning of "important" (compared with statistically significant; see below

Cohort study A non-experimental study design that follows a group of people (a cohort), and
then looks at how events differ among people within the group. A study that examines a cohort, which differs in respect to exposure to some suspected risk factor (e.g. smoking), is useful for trying to ascertain whether exposure is likely to cause specified events (e.g. lung cancer). Prospective cohort studies (which track participants forward in time) are more reliable than retrospective cohort studies.

Confidence interval (CI) The 95% confidence interval (or 95% confidence limits) would include 95% of results from studies of the same size and design in the same population. This is close but not identical to saying that the true size of the effect (never exactly known) has a 95% chance of falling within the confidence interval. If the 95% confidence interval for a relative risk (RR) or an odds ratio (OR) crosses 1, then this is taken as no evidence of an effect. The practical advantages of a confidence interval (rather than a P value) is that they present the range of likely effects.

Controls In a randomized controlled trial (RCT), controls refer to the participants in its comparison group. They are allocated either to placebo, no treatment, or a standard treatment.

Cost-benefit analysis Assesses whether the cost of an intervention is worth the benefit by measuring both in the same units; monetary units are usually used

Cost-effectiveness analysis Measures the net cost of providing a service as well as the outcomes obtained. Outcomes are reported in a single unit of measurement

Crossover randomized trial A trial in which participants receive one treatment and have outcomes measured, and then receive an alternative treatment and have outcomes measured again. The order of treatments is randomly assigned. Sometimes a period of no treatment is used before the trial starts and in between the treatments (washout periods) to minimize interference between the treatments (carry over effects). Interpretation of the results from crossover randomized controlled trials (RCTs) can be complex.

Cross sectional study A study design that involves surveying a population about an exposure, or condition, or both, at one point in time. It can be used for assessing prevalence of a condition in the population.

Effect size (standardized mean differences) In the medical literature, effect size is used to refer to a variety of measures of treatment effect. In Clinical Evidence it refers to a standardized mean difference: a statistic for combining continuous variables (such as pain scores or height), from different scales, by dividing the difference between two means by an estimate of the within group standard deviation.

Evidence based health care The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. Involves all professions associated with health care including purchasing and management

Evidence-based medicine (EBM) The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of EBM means integrating individual clinical expertise with the best available external clinical evidence from systematic research

Experimental study A study in which the investigator studies the effect of intentionally altering one or more factors under controlled conditions.

False negative A person with the target condition (defined by the gold standard) who has a negative test result.

False positive A person without the target condition (defined by the gold standard) who has a positive test result.

Hazard ratio (HR) Broadly equivalent to relative risk (RR); useful when the risk is not constant with respect to time. It uses information collected at different times. The term is typically used in the context of survival over time. If the HR is 0.5 then the relative risk of dying in one group is half the risk of dying in the other group.

Heterogeneity In the context of meta-analysis, heterogeneity means dissimilarity between studies. It can be because of the use of different statistical methods (statistical heterogeneity), or evaluation of people with different characteristics, treatments or outcomes (clinical heterogeneity). Heterogeneity may render pooling of data in meta-analysis unreliable
or inappropriate. If there are a small number of studies, heterogeneity may affect results but not be statistically significant.

Incidence The number of new cases of a condition occurring in a population over a specified period of time.

Intention to treat (ITT) analysis Analysis of data for all participants based on the group to which they were randomized and not based on the actual treatment they received. Different methods go under the name ITT. Therefore, it is important to state how withdrawals were handled and any potential biases, e.g. the implication of carrying last result recorded forward will depend on the natural history of the condition.

Likelihood ratio The ratio of the probability that an individual with the target condition has a
specified test result to the probability that an individual without the target condition has the

same specified test result.

Meta-analysis A statistical technique that summarizes the results of several studies in a single weighted estimate, in which more weight is given to results of studies with more events
and sometimes to studies of higher quality. This is logically distinct from a systematic review, which is defined by an explicitly systematic search and appraisal of the literature. It is also distinct from data pooling, which is based purely on the raw data.

Morbidity Rate of illness but not death.

Mortality Rate of death.

n-of-1 trials In such trials, the patient undergoes pairs of treatment periods organized so that one period involves the use of the experimental treatment and the other involves the use of an alternate or placebo therapy. The patient and physicians are blinded, if possible, and outcomes are monitored. Treatment periods are replicated until the clinician and patient are convinced that the treatments are definitely different or definitely not different

Negative likelihood ratio (NLR) The ratio of the probability that an individual with the target
condition has a negative test result to the probability that an individual without the target condition has a negative test result. This is the same as the ratio (1-sensitivity/specificity).

Negative predictive value (NPV) The chance of not having a disease given a negative test result (not to be confused with specificity, which is the other way round; see below).

Number needed to harm (NNH) One measure of treatment harm. It is the average number of people from a defined population you would need to treat with a specific intervention for a
given period of time to cause one additional adverse outcome. NNH can be calculated as 1/ARI.

Number needed to treat (NNT) One measure of treatment effectiveness. It is the average number of people who need to be treated with a specific intervention for a given period of time
to prevent one additional adverse outcome or achieve one additional beneficial outcome. NNT
can be calculated as 1/ARR

Observational studies Observational studies (case series, case control, prospective or retrospective cohort study) are the most appropriate form of evidence for the Prognosis, Etiology, and Incidence/Prevalence

Odds The odds of an event happening is defined as the probability that an event will occur, expressed as a proportion of the probability that the event will not occur.

Odds ratio (OR) One measure of treatment effectiveness. It is the odds of an event happening in the experimental group expressed as a proportion of the odds of an event happening in the control group. The closer the OR is to one, the smaller the difference in

effect between the experimental intervention and the control intervention. If the OR is greater (or less) than one, then the effects of the treatment are more (or less) than those of the control treatment. Note that the effects being measured may be adverse (e.g. death or disability) or desirable (e.g. survival). When events are rare the OR is analogous to the relative risk (RR), but as event rates increase the OR and RR diverge.

Odds reduction The complement of odds ratio (1-OR), similar to the relative risk reduction (RRR) when events are rare.

Outcomes Outcomes that matter to patients and their carers: this generally means mortality, morbidity, quality of life, ability to work, pain, etc.

Placebo A substance given in the control group of a clinical trial, which is ideally identical in appearance and taste or feel to the experimental treatment and believed to lack any disease specific effects. In the context of non-pharmacological interventions, placebo is usually referred to as sham treatments (see sham treatment below). Placebo is not the same as giving no treatment and can induce real physiological changes. Whether it is appropriate to compare the experimental with placebo or no treatment depends on the question being asked.

Positive likelihood ratio (LR+) The ratio of the probability that an individual with the target condition has a positive test result to the probability that an individual without the target condition has a positive test result. This is the same as the ratio (sensitivity/1-specificity).

Positive predictive value (PPV) The chance of having a disease given a positive test result (not to be confused with sensitivity, which is the other way round; see below).

Power A study has adequate power if it can reliably detect a clinically important difference (i.e. between two treatments) if one actually exists. The power of a study is increased when it includes more events or when its measurement of outcomes is more precise.

Pragmatic study An RCT designed to provide results that are directly applicable to normal practice (compared with explanatory trials that are intended to clarify efficacy under ideal conditions). Pragmatic RCTs recruit a population that is representative of those who are normally treated, allow normal compliance with instructions (by avoiding incentives and by using oral instructions with advice to follow manufacturers instructions), and analyze results by “intention to treat” rather than by “on treatment” methods.

Prevalence The proportion of people with a finding or disease in a given population at a given time.

Publication bias Occurs when the likelihood of a study being published varies with the results it finds. Usually, this occurs when studies that find a significant effect are more likely to be published than studies that do not find a significant effect, so making it appear from surveys of the published literature that treatments are more effective than is truly the case.

P value The probability that an observed or greater difference occurred by chance, if it is

assumed that there is in fact no real difference between the effects of the interventions. If this probability is less than 1/20 (which is when the P value is less than 0.05), then the result is conventionally regarded as being "statistically significant".

Quasi randomized A trial using a method of allocating participants to different forms of care that is not truly random; for example, allocation by date of birth, day of the week, medical record number, month of the year, or the order in which participants are included in the study (e.g. alternation).

Randomized controlled trial (RCT) A trial in which participants are randomly assigned to two or more groups: at least one (the experimental group) receiving an intervention that is being tested and an other (the comparison or control group) receiving an alternative treatment or placebo. This design allows assessment of the relative effects of interventions.

Relative risk (RR) The number of times more likely (RR > 1) or less likely (RR < 1) an event is to happen in one group compared with another. It is the ratio of the absolute risk (AR) for each group. It is analogous to the odds ratio (OR) when events are rare. CE guidance We define relative risk as the absolute risk (AR) in the intervention group divided by the AR in the control group. It is to be distinguished from odds ratio (OR) which is the ratio of events over non-events in the intervention group over the ratio of events over non-events in the control group. In the USA, odds ratios are sometimes known us rate ratios or relative risks.

Relative risk increase (RRI) The proportional increase in risk between experimental and control participants in a trial.

Relative risk reduction (RRR) The proportional reduction in risk between experimental and control participants in a trial. It is the complement of the relative risk (1-RR).

Sensitivity The chance of having a positive test result given that you have a disease

Sensitivity analysis Analysis to test if results from meta-analysis are sensitive to restrictions on the data included. Common examples are large trials only, higher quality trials only, and more recent trials only. If results are consistent this provides stronger evidence of an effect and of generalizability.

Sham treatment An intervention given in the control group of a clinical trial, which is ideally identical in appearance and feel to the experimental treatment and believed to lack any disease specific effects (e.g. detuned ultrasound or random biofeedback). Placebo is used for pills, whereas sham treatment is used for devices, psychological, and physical treatments

Significant By convention, taken to mean statistically significant at the 5% level (see statistically significant below). This is the same as a 95% confidence interval not including the value corresponding to no effect.

Specificity The chance of having a negative test result given that you do not have a disease

Statistically significant Means that the findings of a study are unlikely to have arisen because of chance. Significance at the commonly cited 5% level ($P < 0.05$) means that the observed difference or greater difference would occur by chance in only 1/20 similar cases.

Surrogate outcomes Outcomes not directly of importance to patients and their carers but predictive of patient centered outcomes.

Systematic review A review in which specified and appropriate methods have been used to identify, appraise, and summarize studies addressing a defined question. It can, but need not, involve meta-analysis.

True negative A person without the target condition (defined by a gold standard) who has a negative test result.

True positive A person with the target condition (defined by a gold standard) who also has a positive test result.

Validity The soundness or rigor of a study. A study is internally valid if the way it is designed and carried out means that the results are unbiased and it gives you an accurate estimate of the effect that is being measured. A study is externally valid if its results are applicable to people encountered in regular clinical practice.

Section 4 – Evidence about Clinical Effectiveness

(from The Cochrane Library: Self training guide and notes. Kate Light
NHS Centre for Reviews and Dissemination
University of York
March 2001)
http://www.york.ac.uk/inst/crd/cochlib.htm

Evidence about the clinical effectiveness of health care interventions is becoming increasingly more widely sought and applied by health care practitioners. The Cochrane Collaboration and the NHS Centre for Reviews and Dissemination are concerned solely with evidence from good quality reviews and systematic reviews and their output is being increasingly used. However, it is important not to dismiss primary studies as they are more likely to be the only source of (scientific) evidence in most areas of health care than systematic reviews. A powerful and well conducted single research study can easily provide sufficient evidence to preclude the need for further studies and thus any form of review. But, even if a primary study is not particularly powerful it can still be used as evidence about clinical effectiveness in the absence of any alternative or until further studies or systematic reviews have been conducted. How strong that evidence is a function of the study design and the sample size. The following table provides a ready guide to the different types of evidence about clinical effectiveness and their relative strengths.

Type and Strength of Evidence	
I	Strong evidence from at least one systematic review of well designed RCTs
II	Strong evidence from at least one properly designed RCT of appropriate size
III	Evidence from well designed trials without randomization: single group pre-post, cohort, time series or matched case-controlled studies
IV	Evidence from well designed non-experimental studies from more than one centre or research group
V	Opinions of respected authorities, based on clinical evidence, descriptive studies or reports of expert committees
VI	Someone once told me

In the table above type I evidence is the strongest, type VI the weakest. The strength of the evidence is related to the degree to which bias and confounding factors are controlled. By definition this means that quantitative study designs provide the strongest evidence because they provide the best means of controlling for bias but only if the sample size is large enough and appropriate to control for random effects. This does not mean that the weaker types of evidence in the table are not reliable but simply that it is more difficult to control for bias and random effects. There are many instances where quantitative forms of study design are either not possible or are inappropriate or are even unethical. This could be due to the limited availability of subjects with a particular condition, the need to directly observe subjects to acquire data, the unavailability of any alternative treatment (which would make the withholding of treatment from the control group unethical) or the size and nature of the effect under observation.

Studies which show dramatic effects require less control for bias and random effects than those which show only small effects. Therefore the most appropriate type of study design is also dependent on the size of the effect under investigation as shown in the table below. In the case of the first use of penicillin for severe infections the patients either died or survived, the effect being so dramatic that observation of single patients provided sufficient power to clearly demonstrate effectiveness. At the opposite extreme the effect of steroids on the maturation of the lungs of pre-term babies and their survival is a small effect that can only be measured in terms of percentage improvements in outcome in a population as opposed to an individual effect for each mother treated. Therefore the most powerful form evidence is needed to control for bias and random effects in order to be able to show clear benefit.

Study method	**Example**	**Size of the effect**
observation in single patients	penicillin for severe infections	++++
observation in groups of patients	smoking and lung cancer	+++
randomized controlled trials	aspirin and streptokinase for heart attacks	++
systematic reviews	steroids for women expected to deliver prematurely	+

The two tables above should be used only as a rough guide to whether a particular form of study is appropriate and likely to yield reliable and useful evidence of clinical effectiveness. It should never be forgotten that research studies tend to produce results that may not be relevant to a particular patient or setting and that the clinical experience of each practitioner is also a powerful form of evidence in applying the results of research in practice.

Section 5 – The Evidence Pyramid

(from SUNY Downstate Medical Center Evidence Based Medicine Course)
http://library.downstate.edu/ebm/2100.htm

Section 6 – Clarifying the Problem Using PICO

(from SUNY Downstate Medical Center Evidence Based Medicine Course)
http://library.downstate.edu/ebm/4200.htm

Before starting an EBM search, you must have a clear idea on the type of information you are looking for. What type of treatment options, if any, do you want to explore?
One good way of doing all this is to apply a set of questions to the clinical problem. This is called PICO, which stands for:

Patient or population	Describes patient (age, sex, race, past medical history, etc.)
Intervention (or exposure)	What happens or is to be done; treatment, diagnostic test, exposure (e.g. passive smoking)
Comparison	Compared to what? Nothing, placebo, another intervention
Outcomes (preferably clinical)	What is the effect of the intervention? (Be specific; mortality, hospitalizations)

Before starting a search, write down the answers to these PICO questions. The key elements in the answers will become search terms in your on-line search.

Then identify which type of question you are asking – about therapy, diagnosis, etiology/harm, or prognosis. Each type of question has its corresponding search strategies.

Therapy – questions about what treatment, if any, to give a patient, and what the outcomes of different treatment options might be.

Diagnosis – questions about the degree to which a particular test is reliable and clinically useful, generally asked to decide whether a patient of yours would get enough benefit from the test. Most articles on diagnosis compare the results of the diagnostic test being studied to the results of another standard test that is regarded as being definitive – a "gold standard" test.

Prognosis – questions about patient's future health, life span, and quality of life in the event she/he chooses a particular treatment option.

Etiology/Harm – questions about the relationship between a disease and a possible course

Section 7 – Critical Appraisal of Articles

There are different tools that can help you to appraise articles – special checklists for appraising different types of publications (from the point of view of research design or from the point of view of question types)

CASP has developed such tools for appraising systematic reviews, randomized controlled trials , qualitative research studies , cohort studies , case control studies , diagnostic test studies , and economic evaluation studies (http://www.phru.nhs.uk/~casp/appraisa.htm)

Users' Guides to Evidence-Based Practice provide the following tools for appraising articles: on therapy/prevention, diagnosis, harm, and prognosis (http://www.cche.net/usersguides/main.asp)

Critical appraisal worksheets on Therapy, Diagnosis, Harm, Prognosis, and Systematic review from Canadian Center for Evidence-based Medicine (http://www.cebm.utoronto.ca/teach/materials/caworksheets.htm)

The following are 3 worksheets adapted from Users Guides

Worksheet for Using an Article About Therapy or Prevention

Citation:

_____

_____

_____

Guide **Comments**

Are the Results of the Study Valid?

1. Was the assignment of patients to treatment randomized?

[ ] Yes

[ ] No

[ ] Can't Tell

---

2. Were all patients who entered the trial properly accounted for and attributed at its conclusion?

- was follow-up complete?
- were patients analyzed in the groups to which they were randomized (intention to treat analysis)?

[ ] Yes

[ ] No

[ ] Can't Tell

---

3. Were patients, their clinicians, and study personnel 'blind' to treatment?

[ ] Yes

[ ] No

[ ] Can't Tell

---

4. Were the groups similar at the start of the trial?

- Baseline prognostic factors (demographics, co-morditity, disease severity, other known confounders) balanced?
- If different, were these adjusted for?

[ ] Yes

[ ] No

[ ] Can't Tell

---

5. Aside from the experimental intervention, were the groups treated equally?

Co-intervention?
Contamination?

Compliance?

[ ] Yes

[ ] No

[ ] Can't Tell

---

6. Overall, are the results of the study valid?

[ ] Yes

[ ] No

[ ] Can't Tell

What are the Results

1. How large was the treatment effect?

Absolute risk reduction?
Relative risk reduction?

2.How precise was the estimate of the treatment effect?

Confidence intervals?

Will the Results Help Me in Caring for My Patients?

1. Can the results be applied to my patient care?

Patients similar for demographics, severity, co-morbidity and other prognostic factors?
Compelling reason why the results should not be applied?

[ ] Yes

[ ] No

[ ] Can't Tell

---

2. Were all clinically important outcomes considered?

Are substitute endpoints valid?

[ ] Yes

[ ] No

[ ] Can't Tell

---

3. Are the likely treatment benefits worth the potential harms and costs?

NNT for different outcomes?

[ ] Yes

[ ] No

[ ] Can't Tell

Worksheet for Using an Article About Assessing Diagnostic Tests

Citation:

_____

_____

_____

Guide **Comments**

Are the Results of the Study Valid

1. **Was there an independent, blind comparison with a reference standard?**

Is reference standard used acceptable?
Were both reference standard and test applied to all patients?

[ ] Yes

[ ] No

[ ] Can't Tell

2. Did the patient sample include an appropriate spectrum of patients to whom the diagnostic test will be applied in clinical practice?

[ ] Yes

[ ] No

[ ] Can't Tell

3. Did the results of the test being evaluated influence the decision to perform the reference standard?

"Verification" or "work-up" bias?

[ ] Yes

[ ] No

[ ] Can't Tell

4. Were the methods for performing the test described in sufficient detail to permit replication?

Preparation of patient?
Performance of test?
Analysis and interpretation of results?

[ ] Yes

[ ] No

[ ] Can't Tell

5. Overall, are the results of the study valid?

[ ] Yes

[ ] No

[ ] Can't Tell

What Were the Results?

1. Are likelihood ratios for the test results presented or data necessary for their calculation provided?

How big or small is this LR?

Size of L.R	**Magnitude of charge from pre-to post-test probability**
0.1 or 10	large/conclusive
0.1-0.2 or 5-10	moderate
0.2-0.5 or 2-5	small but sometimes NB
0.5-1 or 1-2	small, rarely NB

[ ] Yes

[ ] No

[ ] Can't Tell

Will the results Help Me in Caring for My Patients?

1. Will the reproducibility of the test result and its interpretation be satisfactory in my setting?

[ ] Yes

[ ] No

[ ] Can't Tell

2. Are the results applicable to my patient?

Similar distribution of disease severity?
Similar distribution of competing diseases?
Compelling reasons why the results should not be applied?

[ ] Yes

[ ] No

[ ] Can't Tell

3.Will the results change my management?

Test and treatment thresholds?
High or low LR's?

[ ] Yes

[ ] No

[ ] Can't Tell

4. Will patients be better off as a result of the test? [ ] Yes [ ] No [ ] Can't Tell	Is target disorder dangerous if left undiagnosed? Is test risk acceptable? Does effective treatment exist? Information from test will lead to change of Management beneficial to patient?

Worksheet for Using an Article About Prognosis

Citation:

_____

_____

_____

Guide **Comments**

Are the Results of the Study Valid?

1. **Was there a representative and well-defined sample of patients at a similar point in the course of the disease?**

Inclusion and exclusion criteria?
Selection biases?
Stage of disease?

[ ] Yes

[ ] No

[ ] Can't Tell

2.**Was follow-up sufficiently long and complete?**

Reasons for incomplete follow-up?
Prognostic factors similar for patients lost- and not lost-to-follow-up?

[ ] Yes

[ ] No

[ ] Can't Tell

3. Were objective and unbiased outcome criteria used?

Outcomes defined at start of study?
Investigaotors 'blind to prognostic factors?

[ ] Yes

[ ] No

[ ] Can't Tell

4. Was there adjustment for important prognostic factors?

[ ] Yes

[ ] No

[ ] Can't Tell

5. Overall, are the results of the study valid?

[ ] Yes

[ ] No

[ ] Can't Tell

What are the Results

1. How large is the likelihood of the outcome event(s) in a specified period of time? Survival curves?

2. How precise are the estimates of likelihood? Confidence intervals?

Will the Results Help Me in Caring for My Patients?

1. Were the study patients similar to my own? Patients similar for demographics, severity, co-morbidity, and other prognostic factors?
Compelling reason why the results should not be applied?

[ ] Yes

[ ] No

[ ] Can't Tell

2. Will the results lead directly to selecting or avoiding therapy?

[ ] Yes

[ ] No

[ ] Can't Tell

3. Are the results useful for reassuring or counselling patients?

[ ] Yes

[ ] No

[ ] Can't Tell

Section 8 –Practice Standard Review Instructions and Template

Instructions for Completing a Practice Standard Review

Summary:

Through the LRC project, AIHA is trying to promote evidence-based practice as a means for its partners to review health care policy and clinical practice at their institutions and in their communities by using the best available research evidence. To encourage this activity, EBP Specialists are required to select a practice (including a clinical intervention, a health care policy or program, an educational method, or any other activity associated with the work of their institutions) and perform a review of the evidence available for this practice. If possible, the EBP Specialist should try to work with other colleagues at his or her institution and should consider forming a committee. From the results of the review, the committee members should draw a conclusion about whether the practice under review is shown to be effective, or if another practice is more effective, or if another practice is equally effective but less expensive. Reviews should be documented thoroughly and provide a bibliography of the research that was included.

Practice Standard Reviews (PSRs) are modeled after systematic reviews, but not meant to be as rigorous. Statistical analysis of results is not required. It also does not imply performing original research. The review should include a critical appraisal and assessment of published evidence, and a conclusion with a recommendation for practice implementation in the particular institution.

Steps:

Step 1 - Identification of the practice for the review
Step 2 - Background research and problem specification
Step 3 - Literature search and retrieval
Step 4 - Preliminary assessment of publications for inclusion based on validity and relevance
Step 5 - Assessment of the content, data extraction, and synthesis
Step 6 - Comprehensive assessment of the review—results
Step 7 - Comprehensive assessment of the review—literature
Step 8 - Comparison with current institutional practice and recommendation
Step 9 - Implementation indicators
Step 10 - Bibliography
Step 11- Submission of review and plans for dissemination

Step 1 - *Identification of the practice for the review*

Prior to selecting a practice for the review, try to identify a group of colleagues that will participate in the review process. Consider forming a committee or engaging existing quality improvement or practice review committees at your institution. Your review may focus on a variety of practices–clinical interventions, nursing procedures, standards of care, training or educational methods, healthcare management approaches, public health programs, or health policies. When choosing a topic for the review, you may want to select something that you feel may not be supported by the evidence or something that your colleagues have differences of opinion about. You can also select a topic that is a priority area for your institution or, if

your institution is involved in AIHA partnership activities, a topic that your partnership is focusing on. You may wish to refer to the Cochrane Library and obtain ideas from the titles of existing systematic reviews.

The topic of your review should contain a question that may be answered with the help of EBM principles and approaches. Usually, such questions are related to therapy, diagnosis, etiology/harm, prognosis or economic analysis. This division into different types of questions will later help you choose the most appropriate types of publications (types of research/study designs) in your literature search. You should be very specific in the practice or procedure you choose. Consider formulating your topic in the form of a question using the PICO (population, intervention, comparison, outcome) method (for more information, see www.uic.edu/depts/lib/lhsp/resources/pico.shtml or www.surgeon.spb.ru/print/2/2/ns0322_20_2.html). Several examples of PSR topics are provided below:

- Changing the Influenza Immunization Policy in Romania: Is It Worthwhile?
- Is it necessary to introduce traditional Graf method of frequent screening of hips for all infants in Latvia?
- Are there any differences in therapy of hepatitis B in elderly patients?
- Is prophylactic use of Indomethacin in preterm infants clinically effective?
- What is the best method of vitamin K administration to prevent hemorrhagic disease in newborns?
- What is the appropriate frequency of arterial hypertension screening for different age groups?

Step 2 - *Background research and problem specification*

Confer with colleagues about their opinions about the practice you have chosen. Review how the selected practice or procedure is implemented at your institution. Investigate any variation in the practice or identify current issues/difficulties related to this practice at your institution. How will your institution benefit from the latest research in this area?

Please note that the Practice Standard Review does not require you to conduct research on your patients – it is a review of your current practice as it compares with the best available evidence.

Step 3 - *Literature search and retrieval*

Your task is to develop a search strategy that will retrieve the best available evidence related to your question. This means that you should first try to search for evidence-based resources. This involves limiting your search to appropriate publication types (research/study designs) for your question. For example, therapy questions are best answered with data from randomized control trials (RCTs), non-randomized control trials, cohort studies and case-control studies. For a table that links types of studies to common question types, please see:

- www.saintjosephdenver.org/courses/FindBestEBM/pyramid

If you are searching MEDLINE via PubMed, make sure to utilize PubMed Clinical Queries. Also remember to incorporate publication dates into your search strategy and to combine your search by keywords with search using Medical Subject Headings (MeSH).

Additionally, you can refer to the following resources that provide access to EBM publications:

- Cochrane Library (www.cochrane.org/reviews/index.htm)
- Clinical Evidence (www.clinicalevidence.com)
- www.tripdatabase.com

The following Web sites make available evidence-based clinical practice guidelines:

- www.guidelines.gov
- www.sign.ac.uk
- www.mja.com.au/public/guides/guides.html
- www.nzgg.org.nz/library.cfm

Please document what and where you search to be sure your search is comprehensive. Use a variety of sources. If you use a Cochrane systematic review as a guide, conduct a MEDLINE search and review additional sources that were published later and therefore were not included in that systematic review.

Step 4 - *Preliminary assessment of publications for inclusion based on validity and relevance*

Review the results of your search with the focus on the quality of the underlying research. Your critical appraisal of the literature should incorporate the issues of validity and relevance. With respect to research validity, consider the questions of study design such as randomization, blinding, sample size, etc. The questions of relevance focus on the applicability of research to the local population. For additional information on the levels of evidence, study validity and relevance, see the following Critical Appraisal Skills Programme (CASP) resources:

- www.show.scot.nhs.uk/nhsfv/clineff/Accessing_evidence/CASP.htm
- www.phru.nhs.uk/~casp/resourcescasp.htm

These criteria should help you determine which publications you can include or exclude from your review. After deciding which publications you will incorporate into your review, please be sure to present selected publications by identifying the number of items for each publication type (e.g. meta-analyses, systematic reviews, etc.) and provide reference numbers in your bibliography. For example:

2 Systematic reviews (4, 5)
6 Randomized control trials (RCTs) (1, 2, 8, 9, 11, 12)
3 Clinical guidelines (6,7,10)

Step 5 - *Assessment of the content, data extraction, and synthesis*

This is the main part of the review where you analyze the information found in EBP publications. What does the literature tell you about your question? What are the main results?

Additionally, try to assess the results by looking at how the results are expressed (odds ratio, relative risk), how precise they are (confidence interval, p-value) and how large/meaningful they are. More information on critical appraisal of various publications and study results is available on the CASP Web sites (see Step 4 above).

Summarize and group publications by results – those that support the intervention and show its effectiveness, those that doubt it, those that prove it not to be effective or even dangerous.

Step 6 - *Comprehensive assessment of the review— results*

Evaluate the review from the results standpoint. Were you able to fully and conclusively answer your question? What does the literature not tell you about your question? Is further research required? What kind of additional research is necessary to provide answers to your question?

Step 7 - *Comprehensive assessment of the review—literature*

Evaluate the comprehensiveness of the literature found for the review. Did you manage to retrieve and analyze the best evidence available on your topic? Sometimes reviews might be constrained by search limitations, a lack of full-text publications or language barriers.

Step 8 - *Comparison with current institutional practice and conclusion*

Compare the results of your review with the current practices at your institution. Does the evidence support your current practice? Does the new data warrant changes? If yes, what are the financial, procedural, or other implications of such practice changes at your institution?

Based on the results of this analysis and discussion, provide a conclusion and recommendations regarding further use of the practice at your institution.

Step 9 – *Implementation indicators*

If you are recommending a change of practice at your institution, what measures of improvement would be the most appropriate to determine the effectiveness of new/changed practice? Try to think of indicators or other measures that would provide an insight on how effective the new practice will be at your institution. This can include morbidity, mortality, length of hospital stay, drug prescriptions patterns, cost savings, etc.

Step 10 - *Bibliography*

This is a numbered list of publications you included in the review. Publications that were excluded from the review for validity or other reasons should not be listed in the bibliography. Please organize your bibliography in chronological or alphabetical order.

For the last section of the PSR template, please provide the names and professional status of participants and contributors for this review - colleagues, partners, committee members, information coordinators, etc.

Step 11 - S*ubmission of review and plans for dissemination*

Submit the review to AIHA staff – Irina Ibraghimova, Mark Storey, Irina Carnevale, and your regional ICT Coordinator. If you have questions or need help throughout the PSR process, please contact Irina Ibraghimova. After your PSR is submitted, AIHA will post the summaries of all Practice Standard Reviews on-line: www.aiha.com/index.jsp?sid=1&id=7992&pid=7976 . The full text of selected, high-quality reviews will also be made available on the EurasiaHealth Knowledge Network (www.eurasiahealth.org) Web site.

Consider sharing the review with the administration of your institution, disseminating it among your colleagues, and publishing it on your institutional Web-site. Your group/committee may choose to announce the results and conclusions of the review at a staff meeting or at other public functions (inside or outside your institution) that would increase awareness and invite further discussion.

Practice Standard Review

Name of EBP Specialist:
Name of Information Coordinator:
Name of Institution:
City:
Country:

Title:
What is the practice or procedure being reviewed? Please formulate the title in the form of a specific question.

Background:
Why have you chosen this practice or procedure for your review? How is the selected policy or practice currently implemented in your institution?

Search strategy:
What is your strategy for identification of studies? Please include keywords and databases/resources searched. If you used MEDLINE, please paste your search history. The information you provide should allow other users to fully reproduce your search results.

Summary of search results:
What is the methodological quality of included studies? Summarize the quality of publications available on this topic. Please indicate the number of items for each publication type (e.g. meta-analyses, systematic reviews, etc.) and refer to the relevant citations listed in your bibliography.

Results of review:
What does the evidence show about the practice? How precise and meaningful are the results? Compare the effectiveness of options considered. Summarize and group publications by results.

Assessment of review—results:
Were you able to fully and conclusively answer your question? What kind of additional research is necessary to provide answers to your question?

Assessment of review—literature:
Where is your review lacking? Did you manage to retrieve and analyze the best evidence available on your topic?

Implications for practice:

Does the evidence support your current practice? Is a change in policy or practice at your institution warranted? What is your recommendation regarding the use of this practice at your institution?

Plans for implementation:

Are you planning to change your practice as a result of this review? If yes, what measure(s) of improvement would be most appropriate to determine and track the effectiveness of new/changed practice (e.g. decreased morbidity/ mortality, shortened length of hospital stay, reduced expenditures, etc)?

Bibliography:

Provide citations for information reviewed. Please organize bibliography as a numbered list in chronological or alphabetical order.

Names of reviewers:

Provide names and professional status of participants and contributors for this review - colleagues, partners, committee members, information coordinators, etc.

Section 9 – Glossary of MEDLINE Terms

(*from Medline Glossary*
http://www.med.ualberta.ca/ebm/medglos.htm
PubMed Tutorial – Glossary
http://www.nlm.nih.gov/bsd/pubmed_tutorial/glossary.html)

Automatic explosion (explode): In PubMed, MeSH terms (as well as any subheading that is the top of a "subheading tree") are "exploded" automatically to retrieve citations that carry the specified MeSH heading (or subheading) and also retrieve citations that carry any of the more specific MeSH headings (or subheadings) indented beneath it in the Tree structure

Automatic Term Mapping: The process used by PubMed to find a match to unqualified terms that are entered into the query box. Terms are matched first against a MeSH Translation Table, then against a Journals Translation Table, then against a Phrase List, and finally against an Author Index. If a match is found in any translation table, the mapping stops. If no match is found, terms are searched in All Fields and ANDed together.

Clinical Queries: Specialized PubMed searches intended for clinicians to limit retrieval to articles that report research conducted with specific methodologies

Explode: permits simultaneous searching of both a broad subject and the narrower subjects classed under it. Because indexing norms require that the most specific subject heading available be applied, normally an article indexed under the specific heading would not also be indexed under the broader heading; thus, searching only the broad subject would result in lost references which have been indexed under the more specific heading.

Mapping: a computer process whereby the search system matches a term entered to the closest subject headings in the database.

Medline: The National Library of Medicine's (NLM's) online database that contains 11 million references to journal articles in the health sciences published since 1966

MeSH: Medical Subject Headings, the thesaurus for Medline; a controlled vocabulary providing consistent terminology for concepts covered by the database.

MeSH Major Topic: The MeSH concepts that are the main points of the article

Related Articles: A PubMed feature that uses a word-weighted algorithm to compare words from the title, abstract, and MeSH headings to calculate a set of PubMed citations that are closely related to the selected article.

Restrict to focus: a choice offered following selection of a subject heading to be searched; choosing "all documents" at this point will retrieve all references indexed with a particular subject heading; choosing "Restrict to focus" will retrieve only
references where this concept is a central focus of the article.

Scope Note: defines a particular MeSH heading and explains its parameters, provides synonyms covered by the heading, year a MeSH heading was adopted by Medline, previous indexing for the MeSH heading, and cross references to other possibly

relevant MeSH headings.

Subheadings: Qualifiers used by the NLM for indexing in conjunction with MeSH for MEDLINE. Subheadings are used to further describe a particular aspect of a MeSH concept, to narrow and focus a MeSH subject heading search; on OVID systems, the scope of each subheading is presented on the right hand panel of the search screen where subheadings are selected. One or several headings may be selected at a time, and "all subheadings" may be selected.

Systematic Reviews: This strategy is intended to retrieve citations identified as systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, guidelines, and citations to articles from journals specializing in review studies of value to clinicians. This subset can be used in a search through the Clinical Queries screen

Textword: exact words found in the title and/or abstract fields; useful for searching if no MeSH heading exists for a specific concept. Textword searching requires the use of synonyms and by-passes the mapping feature that allows "restrict to focus" and subheading selection. Generally, prefer thesaurus searching (i.e., using the subject or MeSH headings).

Section 10 – MEDLINE Search Strategies

Better OVID MEDLINE Search

(from 12 Tips to a Better MEDLINE Search . Duke University Medical Center Library)
http://www.mclibrary.duke.edu/respub/guides/ovd12tip.html

1. **Know what you are looking for**

MEDLINE includes over 11 million citations, but not all of them will be relevant to your information needs. Think about your topic and what will provide the best information. Be specific and break it into the important parts, such as the problem or subject group, intervention, outcome, and/or type of study. You may not need to use all the concepts in the search strategy, but they will be useful in identifying the most appropriate articles.

2**. Search with MeSH headings whenever possible**

MEDLINE is a very structured database, with subject experts reading each article and assigning specific terminology (Medical Subject Headings or MeSH) to describe the content of the article. Searching by textwords (or keywords), on the other hand, is a search for the occurrence of the exact word(s) in the title or abstract, which does not guarantee that the word(s) are actually a topic of the article. The mapping feature in Ovid is designed to help you identify the appropriate subject headings or MeSH terms.

3. **Search for each concept as a separate set**

Break your topic into individual concepts and search for each concept separately. Then, combine the individual sets/concepts to retrieve information on your topic. Creating separate sets for each part of your topic allows you to modify your strategy and combine any sets.

4. **Use the "explode" function to broaden your retrieval**

"Explode" (exp) allows you to include more specific and relevant terms in your search strategy by automatically "ORing" the broad term and all related terms indented under it.

5. **Use the "focus" function to reduce your retrieval**

The "focus" (*) function indicates that the MeSH term is the primary focus of the article and its use can result in more relevant retrieval. Use this when the MeSH heading retrieves a very large number of articles.

6**. Use "truncation" with textwords**

Truncating textwords ($.tw.) allows you to search for a root textword (or keyword) with various endings. It is useful if the textword or phrase can be expressed in a variety of ways.

hypno$.tw. will retrieve hypnosis, hypnotic, hypnotherapy, hypnotize, etc.

7. **Use "adjacency" with textword phrases**

The "adjacency" (adj) operator is used to designate word order for textword phrases. Use this if the phrase may be stated in several different ways. You can add a number to specify how close the terms should be.

patella adj3 taping.tw.
This will retrieve patella within 3 words of taping - patella taping, taping of the patella, taping the patella, or patella held by taping.

8. **Combine Subject Headings (MeSH terms) with textwords**
To improve retrieval, try combining a subject heading with a textword or keyword.
This tip can also be used to retrieve a very specific term or phrase, for which there is no good MeSH term.

9. **Use the "limit" feature**

"Limit" your final set to exclude inappropriate articles. Examples of common limits are language, age groups, and publication types. The most common limits are listed directly below the command box. Additional limits are available from the Limit Icon at the top of the screen.

10. **Use the "subheading" feature to reduce your retrieval**

"Subheadings" can further narrow a search to a specific aspect of a topic. If you are only interested in a specific aspect, consider using appropriate subheadings. (The default is to accept all subheadings.)

methotrexate/ae,to,po,ct
This will retrieve information on the adverse effects, toxicity, contraindications, or poisoning of methotrexate.

Better PubMed MEDLINE Search

1. **Use MeSH Database**

Go the MeSH Database function for identifying NLM Medical Subject Headings (and Subheadings). MeSH Database allows you to: see a definition of most MeSH terms; display MeSH terms in a hierarchical structure, select MeSH terms for searching; limit MeSH terms to a major concept for searching; attach subheading(s) to MeSH terms; display the preferred MeSH term and its hierarchy if a synonym is entered.

2. **Limit to Publication Type**

Limit the results of your search to the publication types: Meta-Analyses, Randomized Controlled Trial, Practice Guideline

3. **Use Clinical Queries and Systematic Reviews Options**

These two specialized search queries are intended for clinicians. You can access the Clinical Queries and Systematic Reviews filters from the Clinical Queries link on PubMed's sidebar.

Both of these built-in search filters limit retrieval to articles that report research done with specific methodologies.

Four study categories or filters are provided within Clinical Queries: therapy (default); diagnosis; etiology; prognosis
Two emphasis categories or filters are also provided:
sensitive search (broad)
-- also referred to as "recall", includes relevant articles, but probably including some less relevant; will get more retrieval
specific search (narrow)
-- also referred to as "precision"; will get less retrieval

The Systematic Reviews filter retrieves systematic reviews and meta-analysis studies for your search subject.

Section 11 – Four Types of Questions and Search Strategies

Finding Good Therapy Studies

(from SUNY Downstate Medical Center Evidence Based Medicine Course)
http://library.downstate.edu/ebm/4300.htm

To find articles on therapy type in the disease (MeSH term) – and choose TH (therapy), DT (drug therapy), PC (prevention and control) as subheadings. Then type in the intervention (drug name) (MeSH term) – and choose TU (therapeutic use) as a subheading. Then combine the results of these two searches. To find EBM sound resources – restrict your findings by particular Publication Types.

Finding Randomized Controlled Studies

For most therapy questions, you will want to look for the best kind of evidence, a randomized controlled study. If the study can be a double blind one, so much the better. There is a common way of finding randomized controlled studies:

1. Limit your search to the Publication Type **Randomized Controlled Trial**. This option gives citations that are the actual reports of randomized controlled trials.
2. Using the MESH term Randomized Controlled Trials is not recommended because as a subject heading it is used as a discussion of the method in medical research, not the report of actual trials.
3. Doing a textword search for random: (i.e. any word that starts with the letters random in the title or abstract of the article). This is a very inclusive search you can use if the first type of search doesn't come up with anything useful (also not recommended)

Finding Double Blind Studies

A good way to find double blind studies is the MESH term **Double Blind Method**. If you need a less restrictive search, try a textword search for **blind**.

Finding Meta-analyses and Systematic Reviews

To find Meta-analyses, use the limit to Publication type and click on **Meta Analysis**
To find systematic reviews in Ovid Medline, you will need to use the limit to Publication type and limit to both **Randomized Controlled Trial** and **Meta Analysis**
Click on Meta analysis and hold down the Ctrl button and then scroll down to Randomized Controlled Trial and while holding down the Ctrl button, click on Randomized Controlled Trial.

Finding Good Diagnosis Studies

(from SUNY Downstate Medical Center Evidence Based Medicine Course)
http://library.downstate.edu/ebm/4400.htm

The fastest and most efficient way to search for valid articles on diagnosis is to type in the diagnosis and use the appropriate MeSH term, type in the diagnostic test, combine, and combine with the MESH heading **Sensitivity and Specificity**. To get this heading, type in Sensitivity : you will get a chance to choose the full MESH heading Sensitivity and Specificity in the next screen. If you type in the full heading, be sure to use quotes around it: "Sensitivity and Specificity"; otherwise OVID interprets the 'and' as a special command to combine two searches.

Explode Sensitivity and Specificity so as to include **ROC curves** and **Predictive Value of Tests**. Both are more specific terms that are being used more and more nowadays instead of, or in addition to, classic measures of the performance of a test in terms of sensitivity and specificity.

If you find you have too many studies, you can also do an AND of your results with the MESH heading double-blind method. This will restrict your search to double blind studies, which are the most reliable type. If there are no double blind studies, you can do a textword search for the word **'blind'**, which hopefully will give you studies that have at least some degree of blinding.

Search Procedure

1. Search for the terms that arise out of your focused clinical question (PICO)
2. Do a search that combines them
3. Type in Sensitivity and press Enter
4. Select the MESH term Sensitivity and Specificity
5. Explode that term to include the narrower MeSH headings: ROC curves and Predictive Value of Tests
6. Do an AND between the results of step 2. and the results of step 5
9. If you have too many studies, type in the word **double**, choose the MESH heading **double-blind method**, and do an AND with the results of the previous step.

Finding Good Prognosis Studies (from SUNY Downstate Medical Center Evidence Based Medicine Course)
http://library.downstate.edu/ebm/4500.htm

The MESH term **Prognosis** is an effective way of finding studies relating to prognosis.
The best study design for answering questions about prognosis will generally be the cohort study. For most prognosis questions of clinical interest, randomized controlled trials are ruled out for ethical reasons.

The best way to find cohort studies is to explode the MESH term **Cohort Studies**.
For the above reasons, a good strategy for finding studies that relate to prognosis is to do exploded searches for Prognosis and Cohort Studies and combine the exploded Prognosis search and the exploded Cohort Studies search using OR.

Depending on what type of prognosis you are interested in, other terms such as:

Mortality (exploded MESH)

Morbidity (exploded MESH)
Risk (exploded MESH)

may also be useful to you in your search.

Finding Good Studies of Harm (from SUNY Downstate Medical Center Evidence Based Medicine Course)
http://library.downstate.edu/ebm/4600.htm

The MESH heading that applies most directly to studies of Harm is **Risk.**

The method almost always used for studies of Harm is the Cohort Study. Randomized controlled studies of Harm questions are generally not possible for ethical reasons, and Case Control studies or Case Series generally do not provide strong enough evidence (though you may have to resort to them if you are desperate for any information at all about what might be causing a certain health problem.)

This means that your best simple strategy is to do searches for the MESH terms **Risk** and **Cohort Study** (both exploded) and then combine them using OR. If you want a slightly broader search, you can do Textword searches for **Risk** and **Cohor**t, which will give you slightly more studies.

Section 12 – The Cochrane Library Training Materials

The Cochrane Library (Clib) is now the premier resource for information on the effectiveness of healthcare interventions. It is a collection of information put together by the Cochrane Collaboration, the NHS Centre for Reviews and Dissemination and others. The Clib is updated quarterly and this guide is for the CD-ROM format.

It includes the following databases:

Cochrane Database of Systematic Reviews (CDSR): full text of completed reviews carried out by the Cochrane Collaboration, plus protocols for reviews currently in preparation.
Database of Abstracts of Reviews of Effectiveness (DARE): abstracts of other systematic reviews; comment on the quality of the methodology of reviews published in the medical literature.
Cochrane Controlled Trials Register (CCTR/CENTRAL): references to randomised controlled trials (RCTs) identified through hand searching of journals and databases. Also the Medical Editors Trials Amnesty, notifications of unpublished trials, with contact details. May be over-inclusive and contain references to trials that prove to be non-randomised.
Cochrane Review Methodology Database (CRMD): references to articles, etc. dealing with the science/methods of systematic reviews, RCTs, etc.

About the Cochrane Collaboration contains contact details for the different Cochrane entities.
NHS Economic Evalutaion Database, (includes structured abstracts of economic evaluations of health care interventions).
Health Technology Assessment (HTA) database (which includes systematic reviews and primary research)

The Cochrane library also contains a **glossary of terms** commonly used in systematic reviews and the Clib, and the **Cochrane Handbook**. It is important to realize that the information you get from different parts of the Clib ranges from full text long reviews in the CDSR, to bibliographic references in the CCTR.

The opening screen
This can be divided into three: toolbar, index window and document window.
The toolbar, down the left-hand side allows you to perform general functions, e.g. searching, printing, help screens and exiting the Clib. The Index window at the top of the screen displays a list of the databases contained in the Cochrane Library with the number of items in each database. Once a search has been performed the number of hits are displayed here. Clicking on the red arrows on the left-hand side will open up the databases to reveal sub-sections and lists of titles. The document window displays a document once it has been selected from the index window, by double clicking on the title.
On the left side of the bar in between the index and document windows are three re-sizing buttons to alter the relative size of the two windows. Also found here on the right, are the **Outline button** to allow you to jump straight to particular sections of the current document and the **Find button** which will search through the displayed document for required words.

Searching
Click on the search button on the toolbar. You cannot select to search any particular database within the library; all databases are searched at once. Some general search features to use in the Cochrane Library are:
Truncation: use an asterisk * to truncate terms, e.g. arter* will retrieve artery, arteries, arterial, etc.
Phrase searching: use quote marks to make the Cochrane Library search for terms as a phrase, e.g. “myocardial infarction” or “hip replacement”.
Combining terms: words can be combined using AND, OR or NOT (Boolean operators). AND will restrict your search by finding records containing both terms e.g. “myocardial infarction” and aspirin.

OR will broaden your search by finding records containing either term e.g. cancer or neoplasm. NOT will find records containing one term but not the other, e.g. "breast cancer" not male.

Simple search: enter key word(s) or simple Boolean searches as above, and click on the search button. This returns you to the index window; the individual hits found (numbers in red) can be viewed by opening up the required databases as described above. You can also restrict a search to just the new or updated items on the Clib via the simple search.

Advanced search: allows the construction of more complicated searches, including index (MeSH) searching. **N.B.** Because not all records are indexed using the thesaurus of MeSH terms, to do a complete search of the Clib, it is necessary to do a combination of MeSH and free text searching. Enter the search terms required and click on the search button. You will see that your searches are recorded in the box below, with each search assigned a number. More complicated combining of searches can be performed here by highlighting searches (hold down CTRL button and click on the individual search) and clicking on the AND, OR or NOT buttons on the right. The advanced screen also allows you to limit searches to particular fields e.g. author, or restrict your search to particular date ranges. The number of hits is displayed after each search. To view the retrieved records click on 'show the results of the search in the index window' button at the bottom of the search screen.

MeSH: Most records on the Clib although not all, are indexed using MeSH (Medical Subject Headings) from the National Library of Medicine. Searches on the Clib are performed by searching through the Permuted index. Enter one word and click on thesaurus. This will take you to that word in the alphabetical index, and list all the occurences of that word in MeSH headings. Select the required heading and click on 'Choose'. This will take you to the MeSH tree for that heading, showing broader and narrower terms around the selected term. To search for the selected term, select 'single term' and click on search. If the term has more specific terms available you can choose to 'Explode in all trees' or 'Explode in selected tree' to search for the selected term AND records indexed using more specific terms. You will see that your MeSH search is imported back into the Advanced search screen, in order that it can be combined with other searches you perform.

Save and load
It is possible to load and save searches and to import and export searches to/from the Clib. Each search saved should be given a different name.

Printing and saving
To select a document to print/save click on the small box to the left of the title in the index window; a tick appears in the box when selected. Click on the 'Print + Save' button on the tool bar. Select what you want to output (either a single document or selected documents) and then the form you want your output in (whole document, short document or list). Then choose to either save or print out your selected references. **N.B.** references from the CDSR can be very long! It is necessary to print out meta-analysis diagrams separately.

Finishing your search
Searches can be cleared using the clear button on the toolbar. To leave the Cochrane Library, make sure you have saved records as required and click on the exit button.

Section 13 – A Guide to Electronic Libraries

This guide provides information on how to obtain access to a variety of full-text health and medical journals, books, and other resources. The following electronic library resources are included:

Scientific Electronic Library
HINARI, WHO Medical Information Network
PubMed Central
"Free Medical Journals"
"Free Medical Books"
HighWire Press Free Online Full-text Articles
HighWire Press Free Access to Developing Economies
BioMed Central
ScienceDirect
eIFL Direct International Consortium
NEICON
Project "Information Saves Life"

Please contact Irina Ibraghimova, Health and Medical Resources Coordinator, American International Health Alliance, ibra@aiha.sovintel.ru, with any questions, comments, or recommendations.

Last updated: April 2003

Scientific Electronic Library (Russia)
A project of the Russian Foundation for Fundamental Studies
URL: http://elibrary.ru

Resources
Full-text electronic versions of journals published by Kluwer Academic Publishers (714 titles), Elsevier Science (410 titles covering all areas of fundamental science), Springer (418 titles) and Blackwell (299 titles). The Medline, AIDSline, CancerLit and Embase Alert databases contain bibliographic information and abstracts of articles in various fields of biomedicine.

Terms and Conditions of Access
Though most journals and databases are available to all registered organizations, some publishers only grant access to a limited number of organizations or charge fees. Any organization irrespective of its status, business area, ownership pattern or geographical location can register itself with the eLibrary.ru server. The only requirement is that the applicant organization must be an independent legal entity.
Identification of an organization in the Scientific Electronic Library is performed based on the IP addresses of the organization's computers. This means that users of those computers will only get access to those information resources of the Library to which the organization has been subscribed. When entering the Library from other computers, one can use all the Library's basic features (including full-text search), except for access to full-text articles. If users connect to the Internet via a dial-up telephone line, the IP address allocated by the

provider may be different for each connection session. There are two options to resolve that problem. The best one is to get a permanent IP address from your ISP. The other option is to request a range of IP addresses from your ISP from which your current ISP address will be allocated and to use both the IP address and password in the identification procedure.

Registration

Only a responsible representative of the applicant organization should fill in the registration form. The procedure is as follows:

- the representative of the applicant organization should fill in the user registration form and organization registration form;
- he/she should print out the License Agreement (http://elibrary.ru/agreement.asp);
- he/she should have the License Agreement signed by the manager of his/her organization, sealed by the official seal of the organization and then sent by conventional mail or courier to Intra Center at 7A Novatorov Str., Office 107, Moscow, 119421, Russia;
- upon receipt of the License Agreement, the organization will be granted the "Registered" status;
- upon registration, the representative of the organization will be granted access to the "Organization Profile" section of the web site where he/she can specify the range of IP addresses for his/her organization and choose those resources from the Library's list of resources which the organization would like (and is qualified) to subscribe to;
- for each of the ordered resources, applications for subscription will be considered by the appropriate coordinators and, in case of a positive decision, the organization will be granted the "Subscribed" status with respect to that particular resource.

HINARI

WHO Medical Information Network

URL: http://www.healthinternetwork.org

Resources

Full texts of 2100 medical journals (published by 30 publishing companies), databases, encyclopedias and reference books (Bloodmed, British National Formulary, Cancer Handbook, Clinical Evidence, The Cochrane Library, Encyclopedia of Life Sciences, Gastrohep, Statistics at Square One).

Terms and Conditions of Access

In 2002, the WHO granted free access to those resources to a group of countries (including Albania, Armenia, Azerbaijan, Georgia, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan). Since 2003, another group of countries and territories (including Belarus, Bosnia, Kosovo, Kazakhstan, Latvia and Romania) has been enjoying access to HINARI with a generous discount off the regular price (they have to pay as little as US$ 1000 per year). The countries in the first group remain to be qualified for free access. The second group will have free access only during the first six months and then will have to pay for it.

Registration

- Fill in the registration form (http://www.healthinternetwork.org/src/registration.php).
- A single password will be sent to your organization (in the name of its librarian or director).

PubMed Central
U.S. National Medical Library (NML)
URL: http://www.pubmedcentral.nih.gov/

Resources
An electronic archive of journal articles on life sciences established and supported by the National Biotechnology Information Center (NBIC) under the NML. Currently includes more than 100 journals. When searching in the PubMed Medline search engine, you will get a link to full texts of those articles available in the archive. Though participation of publishers in the publications of this Web site is voluntary, participating journals must meet certain editorial standards.

Terms and Conditions of Access
Access to the resources is free and unlimited.

Free Medical Journals
A project of Bernd Sebastian Kamps
URL: http://www.freemedicaljournals.com/

Resources
The database contains information on 990 medical journals in various languages (with free access during the first one to six months or one to two years after publication**)**.

Terms and Conditions of Access
Access is free.

Free Medical Books
A project of Bernd Sebastian Kamps
URL: http://www.freebooks4doctors.com/

Resources
The database contains information on 600 medical textbooks, monographs and reference books available on the Internet in various languages.

Terms and Conditions of Access
Access is free.

HighWire Press Free Online Full-text Articles
A project of the Stanford University libraries
URL: http://highwire.stanford.edu/lists/freeart.dtl

Resources
The participating journals focus on science, technology and medicine and are among the most influential publications. The approach to the on-line publication of journals taken by HighWire Press is not limited to the simple creation of electronic images of printed pages. The electronic versions complement the information in printed journals by links to Internet resources, extensive search capabilities, high-resolution images, multimedia and interactive tools. The freely accessible database contains more than 500,000 full-text articles, with some

3,000 new ones being added every month. HighWire Press is, therefore, the world's largest archive of articles on life sciences. You can search across all the journals in the database, choose topics of interest or browse the resources by topic.

Terms and Conditions of Access
Access is free.

HighWire Press Free Access to Developing Economies
A project of the Stanford University libraries
URL: http://highwire.stanford.edu/lists/devecon.dtl

Resources
Forty leading medical journals.

Terms and Conditions of Access
Access is free for low-income countries.

Registration
Not needed as the software will automatically identify the country from which the Web site is accessed.

BioMed Central
BioMed Central Publishing House
URL: http://www.biomedcentral.com/

Resources
BioMed Central is an independent publishing house that grants access to peer-reviewed publications on biomedical studies. BioMed Central publishes on-line journals covering all fields of biology and medicine.

Terms and Conditions of Access
Free access to 57 journals and research articles in the rest of the BioMed Central journals, which can be accessed by subscribers for a charge. The registered users can personalize the contents of the Web site to focus on those articles in the fields of particular interest to them.

Registration
Registration is free.

ScienceDirect
Elsevier Science Publishing House
URL: http://www.sciencedirect.com/

Resources
One thousand seven hundred journals on medicine, sciences and technology. Databases and reference publications.

Terms and Conditions of Access

Unsubscribed users (guest users) are offered free access to 40 medical journals (those are marked as "Complimentary") and to tables of contents and abstracts from the other journals.

---

eIFL Direct International Consortium
URL: http://www.eifl.net

Resources
MEDLINE
Health Source: Consumer Edition
Health Source: Nursing/Academic Edition
Biomedical Reference Collection (CD-ROM)

Terms and Conditions of Access
The list of participating countries (36) and contact details for each of those countries (http://www.eifl.net/countries/). Since 2002, there is a charge payable for participation in the amount depending on the country and type of institution.

NEICON (Russia)
URL: http://www.neicon.ru:8080/

Electronic Information Consortium (EICon) brings together more than 100 Russian libraries interested in productive use of the ever-widening array of sources of electronic information accessible via telecommunication networks. EICon is a member of the eIFL Direct International Consortium.

Resources
1. On-line databases (accessible for the participants of the project on the company's Web site at http://search.epnet.com):
   - Comprehensive MEDLINE with Full Text
   - Health Source: Consumer Edition
   - Health Source: Nursing/Academic Edition
2. Databases on CD-ROMs/DVDs (distributed among the participants twice a year by mail):
   - MEDLINE / Health Source (CD-ROM)

Terms and Conditions of Access
You will have to sign an agreement and pay a charge (the actual amount will depend on the size of your organization and the number of PCs; most medical institutions pay US$ 700-1500 per year).

Project "Information Saves Life"
Project of the Information Center for Libraries and Health Care and Diagnostics Center (Russia)
URL: http://ldc.medcity.ru/Deps/Info/freeinfo.html

Resources
300 medical journals from international publishers

Terms and Conditions of Access
Free for all Russian medical and health care institutions

Registration
Fill in the registration form on the Web-site (identification by IP address)

Section 14 – Review of Web-based EBM Resources

Types of Resources

- Major Sites
- Specialty Sites
- Search
- Training
- DBs
- Evidence-based Clinical Guidelines
- Journals
- Critically Appraised Topics
- Consumer-Oriented Resources
- Mailing lists, newsletters
- Additional Recommended Resources

Major EBM Sites

- **Centre for Evidence-Based Medicine (Oxford)**

http://cebm.jr2.ox.ac.uk/

The NHS R&D CEBM was established in Oxford as the first of several centers around the UK whose goal is to promote evidence-based health care and to provide support and resources to others trying to practice and teach EBM. The website includes an EBM Toolbox with various tools for practicing and teaching EBM, the CATMaker (a software program allowing the user to create 1-page summaries of the evidence), a calendar of EBM events, and links to other EBM sites. There is a search engine available in the CATbank (a database of more than 60 CATs).

- **Evidence-based Medicine Resource Center**

http://www.ebmny.org/

The New York Academy of Medicine in partnership with the Evidence-based Medicine Committee of the American College of Physicians, New York Chapter has received a grant from the National Institutes of Health to develop an Evidence-based Medicine Resource Center. The Web Page contains references, bibliographies, tutorials, glossaries, and on-line databases to guide those embarking on teaching and practicing evidence-based medicine. It offers practice tools to support critical analysis of the literature and MEDLINE searching, as well as links to other sites that help enable evidence-based medical care.

This site is divided into a number of components designed to support:
1.finding the best evidence
2.critical appraisal of the studies obtained
3.easy access to aids needed for finding and appraising the evidence (including links to the User's Guides, EBM toolkits, worksheets and calculators)
4.Teaching of EBM (including links to online tutorials, slides and presentations)

- **Centres for Health Evidence (Canada)**

http://www.cche.net/CHE/home.asp

The principal task of Centres of Health Evidence (CHE) is to package, disseminate, and present health knowledge in ways that facilitate its optimum use. Within the CHE, staff will monitor knowledge-based software and literature from a variety of public and private sources. Significant resources are identified and structured abstracts are developed to alert the user to the quality of evidence and how the needs of specific patients, practitioners and settings are addressed in these resources.

Center for Clinical Effectiveness

http://www.med.monash.edu.au/healthservices/cce/

This site is operated through the Monash Medical Center in Australia. It opened in 1998 with the objective of enhancing patient outcomes through the clinical application of the best available evidence about treatments. The site offers users full evidence reports on a number of topics. As well, it provides good links to similar websites, which are separated by category, making the site easy to use. Finally, the Center has a section of its website where you can actually submit clinical questions regarding patients and they will research the topic of interest and respond directly to your question.

Specialty Sites

Centre for Evidence-Based Mental Health

http://www.cebmh.com

The aim of the CEBMH is to promote and support the teaching and practice of evidence-based mental health care. This site provides materials to help develop skills in practicing EBMH and is aimed at users trying to provide training courses and at people wanting to improve their EBMH skills by working through some online tutorials for practicing EBMH. Links to other useful resources including the full text online journal Evidence-Based Mental Health are also available from this site.

- **Evidence-Based Psychiatry Center**

http://www.med.nagoya-cu.ac.jp/psych.dir/ebpcenter.htm

The Evidence-Based Psychiatry Center, housed within the Department of Psychiatry, Nagoya City University Medical School, accumulates and disseminates the currently available best evidence in the most clinically relevant way possible to practicing psychiatrists world-wide.

- **Evidence-Based Pediatrics Web Site**

http://www.med.umich.edu/pediatrics/ebm

This site is a resource for evidence-based pediatrics provided through the University of Michigan. The site includes a list of CATs, a CAT template (step by step guide on how to create a CAT), guidelines for starting a journal club and links to other websites.

- **BestBETS**

http://www.bestbets.org/

Best Evidence Topics (BETs) were developed in the Emergency Department of Manchester Royal Infirmary, UK, to provide rapid evidence-based answers to real-life clinical questions, using a systematic approach to reviewing the literature. BETs take into account the shortcomings of much current evidence, allowing physicians to make the best of what there is. This site allows you to browse or search a large database of BETs as well as allowing readers to submit their own.

Search Sites

- **SUMSearch**

http://suMSearch.uthscsa.edu/searchform4.htm

SumSearch is a 'meta-searching service' that searches the following resources:
1.Textbook. The default textbook to search is the Merck Manual.
2.MEDLINE for review articles and editorials from high quality, general journals that have full texts available.
3.National Guideline Clearinghouse from the Agency for Health Care Policy and Research (AHCPR)
4.Database of Abstract of Reviews of Effectiveness (DARE)
5.MEDLINE for original research.

Depending of the focus requested SUMSearch will search PubMed with the highest sensitivity filters developed by Haynes et al. SUMSearch will also do focused searches depending on the type of information requested. For example, if the question being searched is one about the physical examination, SUMSearch will search the database Bedside Diagnosis. SUMSearch is easy to use and when the information is retrieved it is sorted by where it was found. For example, it mentions that for broad discussion the information found in the Merck Manual might be useful but it may not be as up-to-date as original published articles located using MEDLINE. It does not provide any information on the search filters it uses.

- **TRIP**

http://www.tripdatabase.com/

The TRIP Database searches over 75 sites of high-quality medical information. The TRIP Database gives you direct, hyperlinked access to the largest collection of 'evidence-based' material on the web as well as articles from premier on-line journals such as the BMJ, JAMA, NEJM etc. A basic version of the TRIP database can be searched without a subscription for free.

Training Resources

- **The EBM Toolbox**

http://minerva.minervation.com/cebm/docs/toolbox.html

The website includes an EBM Toolbox with various tools for practicing and teaching EBM

- **EBM Center of Excellence**

http://www.hsl.unc.edu/ahec/ebmcoe/pages/index.htm

This collection of evidence-based medicine (EBM) resources is intended for faculty, librarians, students and health care professionals interested in learning about EBM. The site provides resources to learn EBM, teach EBM, find current EBM research, or find key EBM resources. North Carolina Area Health Education Center (AHEC) librarians and academic librarians who teach formal EBM programs formed a team to create this virtual EBM Center of Excellence in 2000.

- **Introduction to Evidence-based Medicine**

http://www.hsl.unc.edu/lm/ebm/index.htm

This tutorial is intended for any health care practitioner or student who needs a basic introduction to the principles of Evidence-Based Medicine. Upon completion of this self-paced tutorial, you will be able to: define Evidence-Based Medicine (EBM); based on a patient problem, construct a well-built clinical question; identify searching strategies that could improve MEDLINE retrieval; identify key issues that help determine the validity of evidence
This tutorial is not designed to teach you how to search the literature.

- **SUNY Health Sciences Evidence Based Medicine Course**

http://servers.medlib.hscbklyn.edu/ebm/toc.html

Online course from SUNY that covers the purposes of EBM, a guide to clinical research methods, EBM searching techniques, and the evaluation of medical studies.

DBs

- **Cochrane Library**

http://www.cochrane.org

The Web site of the Cochrane Collaboration. Provides free access to the Systematic Reviews Abstracts
Cochrane Reviews make the results of research assessing the effects of health care more easily available to those who want to make better decisions.

- **MEDLINE - PubMed**

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi

PubMed is an Internet interface for MEDLINE. It has been developed in conjunction with publishers of biomedical literature as a search tool for accessing literature citations and linking to full-text journals at Web sites of participating publishers. Publishers participating in the PubMed project supply the NLM with formatted citations prior to or at the time of publication, and NLM adds them to the PubMed search system. If the publisher has a WWW site that offers full text of its journals, PubMed provides links to that site.

Using the 'Clinical Queries' feature in PubMed, you can restrict retrieval to articles that are most likely to answer your clinical question. This specialized search is intended for clinicians and has built-in search "filters". PubMed is updated continuously as information is received from the publishers.

- **DARE**

http://nhscrd.york.ac.uk/darehp.htm

At its inception in 1994 DARE was known as a database of quality assessed reviews. Staff at NHS CRD identified potential systematic reviews and assessed them against a set of inclusion criteria that sought to select only those of high methodological quality and considers it a database of quality assessed reviews. The NHS Centre for Reviews and Dissemination is funded by the NHS Executive and the Health Departments of Wales and Northern Ireland.

- **PedRO**

http://www.pedro.fhs.usyd.edu.au/index.html

PEDro is an initiative of the Centre for Evidence-Based Physiotherapy (CEBP) in Australia and has been developed to give physiotherapists and others rapid access to bibliographic details and abstracts of randomized controlled trials, and systematic reviews of randomized controlled trials, in physiotherapy. Most trials on the database have been rated for quality to help you quickly discriminate between trials which are likely to be valid and interpretable and those which are not. Most English-language randomized controlled trials and systematic reviews in physiotherapy are on the database. Trials and reviews in other languages are represented, but probably less comprehensively. Information is also provided on how to critically appraise the trials that have been identified. Links to other useful websites are also provided

Journals

- **ACP Journal Club**

http://www.acpjc.org/

ACP Journal Club's general purpose is to select published articles according to explicit criteria and to abstract those studies and reviews that warrant immediate attention by physicians attempting to keep pace with important advances in the treatment, prevention, diagnosis, cause, prognosis, or economics of the disorders managed by internists. These articles are summarized in "value-added" abstracts and commented on by clinical experts.

- **The PedsCCM Evidence-Based Journal Club**

http://PedsCCM.wustl.edu/EBJournal_Club.html

The PedsCCM Evidence-Based Journal Club hopes to help by regular publication of critical reviews of clinical trials pertinent to the practice of pediatric critical care.

Clinical Guidelines

- **National Guideline Clearinghouse**

http://www.guideline.gov/index.asp

The National Guideline Clearinghouse™ (NGC) is a comprehensive database of evidence-based clinical practice guidelines and related documents produced by the Agency for Healthcare Research and Quality (AHRQ) (formerly the Agency for Health Care Policy and Research [AHCPR]), in partnership with the American Medical Association (AMA) and the American Association of Health Plans (AAHP). Key components of NGC include:

Structured abstracts (summaries) about the guideline and its development;
A utility for comparing attributes of two or more guidelines in a side-by-side comparison;
Syntheses of guidelines covering similar topics, highlighting areas of similarity and difference;
Links to full-text guidelines, where available, and/or ordering information for print copies;
An electronic forum, NGC-L for exchanging information on clinical practice guidelines, their development, implementation and use;
Annotated bibliographies on guideline development methodology, implementation, and use.

National Library of Medicine's Health Services/Technology Assessment Text (HSTAT)
http://text.nlm.nih.gov/ftrs/gateway

This site is basically a very detailed search engine. It contains holdings from the AHCPR support guidelines, the AHCPR technology assessments and reviews, ATIS (HIV/AIDS technical information), NIH Warren G. Magnuson Clinical Research Studies, NIH Consensus Development Program, PHS Guide to Clinical Preventative Services (1989) and SAMHSA/CSAT Treatment Improvement Protocol (TIP).

- **Scottish Intercollegiate Guidelines Network (SIGN)**

http://www.sign.ac.uk/

SIGN has a program of 60 evidence-based clinical guidelines - published, in development, or under review - covering a wide range of topics. Many of the SIGN guidelines relate to the NHS priority areas of cancer, cardiovascular disease, and mental health.

- **CDC Recommends: The Prevention Guidelines System**

http://www.phppo.cdc.gov/CDCRecommends/AdvSearchV.asp

CDC Recommends: The Prevention Guidelines System contains up-to-date and archived guidelines and recommendations approved by the CDC for the prevention and control of disease, injuries, and disabilities.

- **MJA Clinical Guidelines**

http://www.mja.com.au/public/guides/guides.html

Clinical guidelines published by the Medical Journal of Australia represent the consensus opinion of experts based on review of the scientific literature

- **New Zealand Guideline Group**

http://www.nzgg.org.nz/library.cfm

Objectives of the NZGG Web Site

- To act as a reference source for guideline material in New Zealand
- To act as a resource centre for knowledge and information on the development of guidelines and their local adaptation for decision making within New Zealand
- To act as a communication centre for the sharing of knowledge and experience on the whole guideline process and to encourage debate on all relevant topics

Critically Appraised Topics

- **ARIF**

http://www.bham.ac.uk/arif/

Aggressive Research Intelligence Facility - ARIF is a specialist unit of six people based at the University of Birmingham. Its role is to improve the incorporation of search findings into population level health care decisions in the NHS in the West Midlands region. It is done by helping health care workers access and interpret research evidence, particularly systematic reviews of research, in response to particular problems they are experiencing.

- **CATs**

http://cebm.jr2.ox.ac.uk/docs/catbank.html
http://www.urmc.rochester.edu/MEDICINE/RES/CATS/index.html

A CAT is a short summary of the evidence to a focused clinical question with the following elements:
1.Title - This gives a declarative answer to your question and a title.
2.Clinical scenario - this is a one sentence summary of the patient problem that drove the quest for evidence.
3.Clinical bottom line - The bottom line on how this evidence is used in clinical care.
4.The evidence - Summary of the type of article, size of population studied, and a table summarizing the evidence (NNT, LR's, OR's etc.)
5.Comments - these include pertinent issues in the critical appraisal, key elements of cost or other consequences such as side effects, and any "nuts and bolts" information on how to implement the evidence, eg. dosage, etc.
6.Citation

- **POEMs**

http://www.ebponline.net

Each month, our board of editors searches more than 90 journals for articles of interest to the family physician. Articles that could alter the course of family medicine are identified as POEMs—Patient-Oriented Evidence that Matters**.**

In order to be considered a POEM, a research article must: address a primary care question that you commonly face; Measure outcomes that are relevant to you and your patients, such as symptoms, morbidity, quality of life, and mortality; Have the potential to change the way you practice.

Consumer-oriented Resources

- **Cochrane Consumer Network**

http://www.cochraneconsumer.com/

- **MEDLINE plus: Health Topics**

http://www.nlm.nih.gov/medlineplus/healthtopics.html

- **Hitting The Headlines**

http://www.nelh.nhs.uk/hth/archive.asp

Mailing lists, newsletters

- **DARE mailing list**

http://nhscrd.york.ac.uk/daremail.htm

- **Effective Health Care bulletins**

http://www.york.ac.uk/inst/crd/ehcb.htm

- **Cochrane Library Users' Group**

http://www.york.ac.uk/inst/crd/clugmail.htm

Additional Recommended Resources

Netting the Evidence

http://www.shef.ac.uk/scharr/ir/netting/

The goal of this website is to provide a complete list of evidence-based practice resources that are available on the Internet. There are more than 140 listings (arranged alphabetically), each of which includes a short description of the resource with a link to it. This list is preceded by a link to "the latest articles on Evidence Based Medicine from the MEDLINE database". The website is easy to use and a search engine is provided.

Section 15-a – EBP Specialist Quarterly Progress Report-

EBP Specialists at LRCs that are currently being funded by AIHA should submit progress reports to AIHA once each quarter. These reports are intended to help LRC Staff and AIHA monitor EBP-related activities at each LRC as well as to provide opportunities for feedback and information exchange.

Reports should be submitted on March 1, June 1, September 1, and December 1. Reports should be sent by e-mail to Mark Storey, Irina Carnevale, and Irina Ibraghimova as well as to the AIHA Regional ICT Coordinator for your region.

Name of Information Coordinator:
Name of Institution:
City:
Country:

1. Please list the titles of all lectures and training sessions provided to health professionals since the last progress report you submitted. (If the same session is provided more than once, please list each separately.)

Title of lecture or training session	Name(s) of lecturer or trainer	Dates of lecture or training session	Number of hours of lecture or training session	Number of participants

2. Please list all new EBP resources or reports developed since the last progress report you submitted. This should include any handouts, evidence reports, articles, etc. Please also attach any resources that can be shared with other institutions to your progress report when submitting it.

Name of resource or report	Description of resource or report	Number of people who received the resource or report	Name of author(s)	Date of publication

3. Other Developments – Please provide any new information about the development of EBP at your institution. This might include information about health professionals' experiences with EBP,

changes in institutional quality review processes, news about PSR working groups, or any other interesting information describing your work with EBP.

4. Your Information Needs – What additional resources would be useful in helping you to promote EBP at your institution?

5. Additional Questions or Comments for AIHA Project Managers.

Section 15-b – Institutional Evidence-Based Practice Survey

Instructions for Completing
Institutional Evidence-Based Practice Survey

This questionnaire is designed to determine the procedures and mechanisms that staff at your institution use to assess and update practice. The questionnaire is intended for use by all types of AIHA partnership health care institutions, not just clinical institutions. There is a wide range of activities that are potentially subject to the principles of evidence-based practice. For the purposes of this survey, please consider the term "practice" to include the primary activities and functions of your institution. These might include the following:

- clinical practice (diagnosis, treatment and prevention)
- nursing practice (standards of care)
- training and education (educational methods; clinical practice and other topics covered by curricula)
- management of public health programs (health promotion campaigns; epidemiologic standards)
- health policy (health care financing and management of the service delivery system)
- research

For the purposes of this survey, the term "evidence" can be considered to include the following:

- articles, textbooks, and reports based on randomized controlled clinical trials
- meta-analyses and systematic reviews (from Cochrane, etc.)
- evidence-based practice guidelines
- reviews of effectiveness (of social programs, health care interventions, etc.)
- economic evaluations of health care interventions
- other published research based on methods of clinical epidemiology

For the purposes of this survey, the term "standard" is used to represent a wide range of things:

- guidelines (procedural/administrative)
- practice guidelines (clinical)
- clinical pathways, algorithms, and protocols

EBP Specialists must complete this questionnaire in consultation with colleagues at their institution. Please submit the questionnaire by June 1 each year to Mark Storey, Irina Carnevale, Irina Ibraghimova, and your Regional ICT Coordinator.

Thank you for your time and effort!

Institutional Evidence-based Practice (EBP) Survey

Note: Our goal is to understand what systems and procedures your institution has in place, so please provide detailed responses. If you do not provide enough detail, AIHA staff may need to write you back for additional clarification.

Section 1:

1. **Name of Institution, City and Country:**
2. **Name of Information Coordinator:**
3. **Name of EBP Specialist:**

4. How does your institution ensure that current practice is consistent with the most current evidence:

   (Please check all that apply. You may check more than one answer.)

   a. It is up to individual staff to ensure that their practice is consistent with current evidence. ☐
   b. Staff comply with standards that are established by other organizations (Ministry of Health, etc.). ☐
   c. Staff comply with standards that are established by our own institution. ☐

Section 2:
(If you selected option b in question No. 4, please answer the questions in this section. If not, please go to section 3.)

5. If you indicated in question No. 4 that staff comply with standards that are established by other organizations, please indicate all organizations from which your institution receives such standards.

6. Are there any mechanisms for individual staff to challenge or question current standards? (If yes, please describe.)

7. How does your institution make staff aware of these standards?

8. What, if anything, does your institution do to monitor staff compliance with these standards?

9. What, if anything, does your institution do to monitor the effectiveness of these standards to see whether they are having a positive impact?

Section 3:
(Everyone should answer at least question No. 10 in this section.)

10. Is there a group (or groups) of staff at your institution which meets regularly to review and/or develop practice standards, compliance with practice standards, or other quality-related issues?

If the answer to question No. 10 was "No," please skip to section 4.

11. Is there one group or multiple groups? What is the name of the group(s) and its (their) responsibilities?

Note for the questions below, if your institution has multiple groups responsible for reviewing and/or developing practice standards, compliance with practice standards, etc., please provide separate answers for each group.

12. How many people are in the group(s)?

13. What are the titles/positions/departments of the people in the group(s)?

14. How regularly does the group(s) meet?

15. Does the group(s) review all topics of practice within your institution, or just a limited set of topics?

16. How does the group determine which topics need to be reviewed?

17. If the group(s) reviews only a limited set of topics, please indicate which topics it reviews.

18. How regularly does the group(s) review each specific topic?

19. From where does the group(s) gather evidence to discuss the topics under review? What resources are used to find evidence-based information?

20. Does the group(s) develop written standards (practice guidelines, protocols, algorithms, or any other sort of standard)?

21. If yes, how does the group(s) determine which topics need to have written standards developed and which do not?

22. Once a topic has been reviewed, how does your institution make staff aware of recommended changes in practice?

23. What, if anything, does your institution do to monitor staff compliance with these recommended changes?

24. What, if anything, does your institution do to monitor the effectiveness of these recommended changes to see whether they are having a positive impact?

Section 4:
(Everyone should answer the questions in this section.)

25. What, if anything, does your institution do to ensure that the practice of individual staff is consistent with the current evidence?

26. How, if at all, are staff encouraged to keep up-to-date with the current best evidence in their field?

27. What would you consider to be the ideal mechanism at your institution for ensuring that current practice is consistent with the most up-to-date evidence? For example, should individual staff be responsible for regularly reviewing their own practice, or maybe staff or groups of staff at your institution should develop mandatory or voluntary standards? How would you balance the need for staff decision-making autonomy and the need for quality control standards?