

# EVIDENCE-BASED PRACTICE: A PRACTICE MANUAL

*appraise*

*assess*

*acquire*

*apply*

*ask*

Evidence-Based Practice Group South East

Compiled by Brendan Leen, Miriam Bell, Patricia McQuillan  
on behalf of the EBP Group South East



# BACKGROUND

The Evidence-Based Practice (EBP) Group South East is a multidisciplinary group of healthcare professionals with a common interest in teaching and promoting the skills involved in evidence-based practice. We began working together in 2007 and two years later hosted a three-day workshop which took place in Waterford Regional Hospital in November 2009, co-facilitated by the Centre for Evidence-Based Medicine, Oxford University,<sup>1</sup> and healthcare professionals from the South East and the wider healthcare community in Ireland. More than 60 nurses, midwives, physicians, surgeons, health and social care professionals and medical librarians contributed to an enormously successful and positive workshop. Afterward, EBP education continued through clinically-based EBP journal clubs and local skills workshops, and the South East Library Service launched its Clinical Queries service.<sup>2</sup>

By 2011, we had identified a need to provide a simple start-up manual for other healthcare professionals interested in implementing the principles of EBP in clinical practice. *Evidence-Based Practice: A Practice Manual* is our response to that need. We have compiled the *Practice Manual* with one guiding principle in place: provide only as much information as is necessary to get you started, but enough information that the *Practice Manual* will be a useful resource in your clinical setting. Our aim is simply to outline the basic steps of EBP and to provide signposts where more detailed information and assistance may be obtained. Look out for the  **READ MORE** signposts as you read through the *Practice Manual*.

In compiling our *Practice Manual*, we acknowledge the Centre for Evidence-Based Medicine, Oxford University, and the *Evidence-Based Practice Workbook* by Paul Glasziou,

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1 See <http://www.cebm.net/>. Accessed 04 December 2013.

2 See page 16: "Clinical Queries."

Chris Del Mar and Janet Salisbury<sup>3</sup> as core reference sources. We are grateful for their permission to reproduce sections of the workbook in this *Practice Manual*.

The *Practice Manual* is set out in five colour-coded chapters with each chapter corresponding to one of the five basic steps of EBP. Use the colour-coded tabs to quickly refer to the section of the *Practice Manual* you need.

We hope that you find the guide useful and informative and that it can help improve the quality of patient care in your ward, unit or other clinical setting.

EBP Group South East

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<sup>3</sup> Glasziou, P., Del Mar, C. and Salisbury, J., *Evidence Based Practice Workbook*, 2<sup>nd</sup> edition (Oxford: Blackwell Publishing, 2007).

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# INTRODUCTION

## WHAT IS EVIDENCE-BASED PRACTICE?

Many definitions exist, but one of the most commonly accepted is contained in the *Sicily Statement on Evidence-Based Practice*:

“Evidence-Based Practice requires that decisions about health care are based on the best available, current, valid and relevant evidence. These decisions should be made by those receiving care, informed by the tacit and explicit knowledge of those providing care, within the context of available resources. All health care professionals need to understand the principles of Evidence Based Practice (EBP), recognise it in action, implement evidence-based policies, and have a critical attitude to their own practice and to evidence. Without these skills professionals will find it difficult to provide best practice.”<sup>4</sup>

📖 [READ MORE](http://www.biomedcentral.com/1472-6920/5/1). The Sicily Statement is available in full here: <http://www.biomedcentral.com/1472-6920/5/1>.

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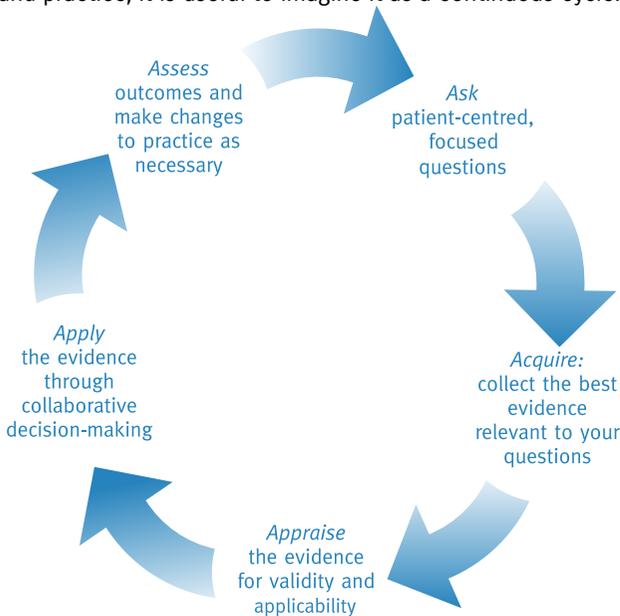
<sup>4</sup> Dawes, M. et al., “Sicily Statement on Evidence-Based Practice,” *BMC Medical Education*, (1), 2005.

# WHAT ARE THE FIVE STEPS OF EBP?

The five steps of EBP – or 5 A's – begin and end with the patient

1. *Ask* patient-centred, focused questions about the care of individuals, communities or populations.
2. *Acquire* the best available evidence relevant to your question.
3. *Appraise* the evidence for validity and applicability to the problem at hand.
4. *Apply* the evidence by engaging in collaborative decision-making with individual patients and/or groups. Appropriate decision-making integrates the context, values and preferences of the care recipient, as well as available resources, including professional expertise.
5. *Assess* the outcomes and disseminate results.

Because the evidence-based process informs future questions and practice, it is useful to imagine it as a continuous cycle:<sup>5</sup>

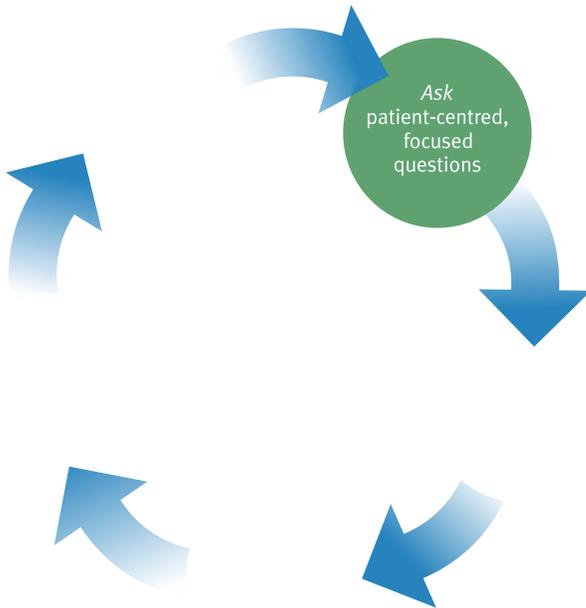


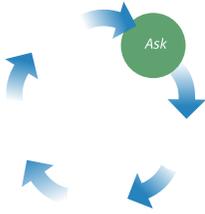
<sup>5</sup> Evidence-Based Behavioral Practice, "Steps for Evidence-Based Behavioral Practice," <http://www.ebbp.org/steps.html> . Accessed 18 March 2014.



# STEP 1

Ask patient-centred,  
focused questions





## HOW DO I ASK WELL-FORMULATED, ANSWERABLE QUESTIONS?

Questions are often only partly formulated, which makes finding answers in the literature a challenge. Breaking down the question into its component parts and restructuring it so that it is easier to find answers is an important first step in EBP.

Most clinical questions can be divided into four components, often abbreviated as PICO:

P

patient  
population  
problem

I

intervention  
indicator  
index test

C

comparator  
control strategy  
control test

O

outcome

T

time

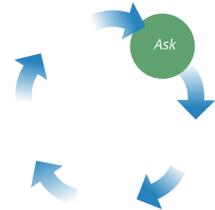
- *Patient, Population or Problem (P)*: What person or group of people are you interested in? What is the specific clinical problem that you have in mind?
- *Intervention or Indicator (I)*: What is the treatment strategy, exposure or test that you want to find out about in relation to the clinical problem? This might be:
  - an intervention: a procedure, such as a drug treatment, surgery or diet
  - an indicator: exposure to an environmental hazard, a physical feature such as being overweight, or a factor that might influence a health outcome
  - an index test: a diagnostic test, such as a blood test or brain scan
- *Comparator or Control (C)*: an alternative control strategy, exposure or test.
- *Outcome (O)*: What are you or the patient most concerned about happening, or preventing happening?

A timeframe is often implicit in the clinical question, but it is sometimes useful to add the timeframe explicitly, giving us PICO(T):

- *Time (T)*: What is the timeframe of the clinical question?

Once you have your clinical question in PICO(T) format, there are two additional facets that you should consider:

1. What type of question are you asking?
2. What type of study will best answer your question?



There are several different types of clinical question:<sup>6</sup>

| Question Type          | Description  |
|------------------------|--|
| Diagnosis              | <ul style="list-style-type: none"> <li>▪ how to determine whether a person has a condition or problem</li> <li>▪ how to select and interpret appropriate diagnostic tests</li> </ul>                         |
| Therapy/Intervention   | <ul style="list-style-type: none"> <li>▪ how to select interventions that will help a patient and that are worth the time and costs involved</li> </ul>  |
| Aetiology/Risk Factors | <ul style="list-style-type: none"> <li>▪ how to identify the cause of a disease</li> <li>▪ how to determine whether people with a given risk factor are more vulnerable to a condition or problem</li> </ul> |
| Prognosis/Prediction   | <ul style="list-style-type: none"> <li>▪ how to predict a patient's clinical course into the future</li> <li>▪ how to anticipate potential complications</li> </ul>  |
| Frequency/Rate         | <ul style="list-style-type: none"> <li>▪ how to ascertain what percentage of the population has a condition or problem</li> </ul>  |
| Phenomena              | <ul style="list-style-type: none"> <li>▪ how to identify the outcomes most important to a patient or population</li> </ul>   |

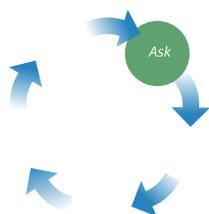
**intervention:** an intervention can include a wide range of activities from drug therapy or another clinical therapy to lifestyle changes such as diet or exercise. Ask yourself: what is the effect of the intervention on the clinical problem? Will the intervention help a patient with a specific clinical problem?

**aetiology:** the cause of a disease

**prognosis:** the probable course of a disease

Table 1: Question Types.

<sup>6</sup> Adapted from: Glasziou, P., Del Mar, C. and Salisbury, J., *Evidence Based Practice Workbook*, 2<sup>nd</sup> edition (Oxford: Blackwell Publishing, 2007), 23; Duke University Medical Centre Library and the Health Sciences Library, University of Carolina at Chapel Hill, "Introduction to Evidence-Based Practice," <http://guides.mclibrary.duke.edu/ebmtutorial>. Accessed 04 December 2013.



Different types of questions require different study designs. Once you have identified your question type, you will be better able to target the specific studies that best answer your clinical question.

In each case, a systematic review of all relevant studies is preferable to an individual study.

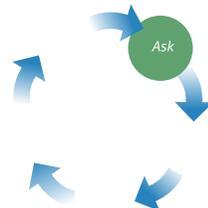
**systematic review:** a review focused on a specific clinical question; the author(s) attempt to identify the main findings or recommendations from the best available evidence on a specific question or topic and synthesize the results in a systematic manner according to predetermined criteria

**randomised controlled trial (RCT):** a study in which participants are randomly allocated to receive either an intervention or a control

| Question                    | Best Study Designs  | Description   |
|-----------------------------|---|---|
| Therapy/<br>Intervention    | Randomised<br>Controlled<br>Trial                                       | Subjects are randomly allocated to treatment or control groups and outcomes assessed.   |
| Aetiology/Risk<br>Factors   | Randomised<br>Controlled<br>Trial                                       | As aetiology questions are similar to intervention questions, the ideal study type is an RCT. However, it is usually not ethical or practical to conduct such a trial to assess harmful outcomes. |
|                             | Cohort Study  | Outcomes are compared for groups with and without an exposure or risk factor: prospective study.  |
|                             | Case-Control<br>Study   | Subjects with and without an outcome of interest are compared for previous exposure or risk factor: retrospective study.  |
| Frequency and<br>Rate       | Cohort Study  | As above.   |
|                             | Cross-<br>Sectional<br>Study  | Measurement of a condition in a representative – preferably random – population sample.   |
| Diagnosis                   | Cross-<br>Sectional<br>Study with<br>Random or<br>Consecutive<br>Sample | Preferably an independent, blind comparison with a gold standard test.  |
| Prognosis and<br>Prediction | Cohort/<br>Survival Study   | Long-term follow-up of a representative cohort.   |

Table 2: Study Designs.<sup>7</sup>

<sup>7</sup> Adapted from: Glasziou, P., Del Mar, C. and Salisbury, J., *Evidence Based Practice Workbook*, 2<sup>nd</sup> edition (Oxford: Blackwell Publishing, 2007), 39.



If you're unsure what the design of any given study might be, the following table may prove helpful:<sup>8</sup>

|  |                  |  |  |  |            |
|--|------------------|--|--|--|------------|
| <i>Are two or more people compared?</i>          |                  |  |  |  |            |
| <input checked="" type="checkbox"/> YES          |                  |  | <input checked="" type="checkbox"/> NO             |  |            |
| <b>Comparative Studies</b>                       |                  |  | <b>Descriptive Studies</b>                         |  |            |
| <i>Are people randomly allocated to groups?</i>  |                  |  | <i>Is there more than one person in the study?</i> |  |            |
| <input checked="" type="checkbox"/> YES          |                  | <input checked="" type="checkbox"/> NO   |  |  |            |
| <b>Non-Randomised Comparative Studies</b>        |                  |  |  |  |            |
| <i>Do researchers allocate people to groups?</i> |                  |  |  |  |            |
| <input checked="" type="checkbox"/> YES          |                  | <input checked="" type="checkbox"/> NO   |  | <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO |            |
|  |                  | <i>Are people selected to be in groups because they have a particular treatment, exposure or test?</i> |  |  |            |
|  |                  | <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO                         |  |  |            |
|  |                  | <i>Are people selected because they have a disease (case)? Or don't have it (control)?</i>             |  |  |            |
|  |                  | <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO                         |  |  |            |
| Randomised Controlled Trial (RCT)                | Controlled Trial | Cohort Study   | Case Control Study                                 | Case Series  | Case Study |

**controlled trial:** similar to a randomised controlled trial, but participants are not randomly allocated to intervention and control groups

**cohort study:** a study reporting observations on a group or cohort of people who have been exposed to a risk factor and comparing them with another cohort or the general population who have not been exposed. In prospective studies, a cohort is identified at a point in time and followed into the future; in retrospective studies, a cohort is defined at a point in time in the past and subsequent outcomes collated

**case study:** a study reporting observations on a single individual

**case control study:** a study in which two existing groups with a different outcome are compared for previous exposure or risk factor

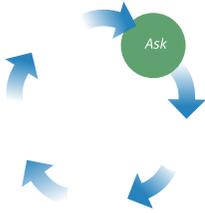
**case series:** a study of a group of people receiving the same treatment or with the same condition or problem; this type of study can describe the characteristics or outcomes of the group in question, but cannot infer comparisons with another group receiving a different treatment or who don't have the condition or problem

← Highest Quality Evidence

Lowest Quality Evidence →

Table 3: Algorithm of Study Designs.

<sup>8</sup> Adapted from: Centre for Clinical Effectiveness, Southern Health, Melbourne, Australia, *Evidence-Based Answers to Clinical Questions for Busy Clinicians* (Melbourne: Centre for Clinical Effectiveness), 25.



## SAMPLE INTERVENTION QUESTION<sup>9</sup>

You are presented with the following clinical problem: the parents of a severely autistic 6-year-old boy are unhappy that no interventions have significantly improved his lack of social communication. They were excited to learn from the parents of another autistic child that a new treatment – the use of intravenous secretin – has resulted in a dramatic benefit for many children. Could this treatment help their child?

*What is the PICO(T) of this question?*

- **Patient:** autistic child, 6 years of age
- **Problem:** social communication
- **Intervention:** intravenous secretin
- **Comparator:** no treatment
- **Outcome:** improved social communication
- **Time:** N/A

*What is the clinical question?*

Does the use of intravenous secretin improve social communication in severely autistic children?

*What is the question type?*

Therapy/Intervention  Aetiology/Risk Factors  Diagnosis   
Prognosis/Prediction  Frequency/Rate  Phenomena

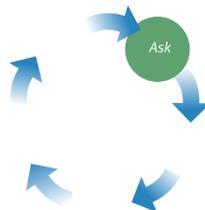
*What type of study will best answer an intervention question?*

A randomised controlled trial (RCT).

<sup>9</sup> Adapted from the National Network of Libraries of Medicine website at <http://nnlm.gov/>. Accessed 04 December 2013.

## SAMPLE DIAGNOSIS QUESTION<sup>10</sup>

Your hospital is exploring diagnostic test options in the case of a recent H1N1 flu epidemic in your area.



*What is the PICO(T) of this question?*

- **Population:** general population;  
**Problem:** H1N1 influenza
- **Index Test:** rapid antigen test
- **Control Test:** RT-PCR test
- **Outcome:** accurate diagnosis of H1N1
- **Time:** 24 hours

*What is the clinical question?*

Is the rapid antigen test for H1N1 influenza as accurate as the standard RT-PCR test?

*What is the question type?*

Therapy/Intervention  Aetiology/Risk Factors  **Diagnosis**   
Prognosis/Prediction  Frequency/Rate  Phenomena

*What type of study will best answer a diagnosis question?*

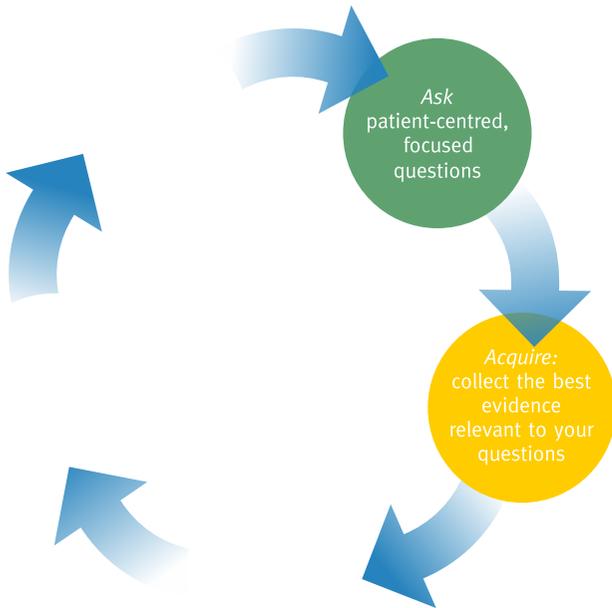
A cross-sectional study with a random consecutive sample.

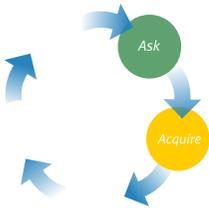
<sup>10</sup> Adapted from the National Network of Libraries of Medicine website at <http://nnlm.gov/>. Accessed 04 December 2013.



# STEP 2

*Acquire:* collect the best evidence relevant to your question





Now that you have formulated an answerable question, your next step is to acquire the best quality evidence available to answer your question.

## WHAT DOES BEST QUALITY EVIDENCE MEAN?

Internet search engines – eg Google – accumulate vast quantities of results, the majority of which will be peripheral or irrelevant to your search.

Consider the intended audience of the website. Is it a commercial website (.com) whose purpose may be to sell you something? Or alternatively an organisation (.org) whose purpose is to disseminate quality information?

Consider the objectivity of the website. Sites sponsored by a pharmaceutical company, for example, may give a specific bias to the information provided.

How accurate and reliable is the information provided? Almost anyone can publish a website, and the majority of sites are not peer reviewed or externally evaluated. Double check important facts against other sources.

How current is the information provided? Regularly updated websites are generally more reliable sources of information.

## TOO MUCH INFORMATION?

For clinical questions, it's best to search custom search engines or databases as these will get you to your answer more quickly and you can be more confident of the quality of information provided.

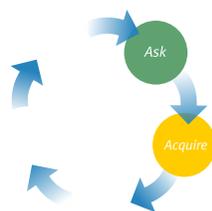
The Cochrane Library is a unique source of reliable and up-to-date information about the effects of interventions. Similarly, UpToDate is an evidence-based, peer-reviewed source of information with which you can quickly answer clinical questions and improve patient care. Both are available via the South East Library Service at <http://www.hselibrary.ie/southeast/>.

A database is a collection of peer-reviewed, high-quality literature on a specific subject or set of related subjects. There are 3 main databases available via the South East Library Service at <http://www.hselibrary.ie/southeast/>:

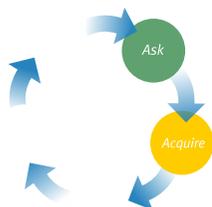
- **CINAHL** is an excellent source of literature in the disciplines of nursing and allied health. Use CINAHL when you want to search for: nursing and midwifery (primary subjects); allied health and social care (other subjects).
- **MEDLINE** is the most comprehensive source of literature in the medical sciences. Use MEDLINE when you want to search for: medicine and surgery (primary subjects); nursing, midwifery, allied health, psychiatry and psychology (other subjects).
- **PsycINFO** provides extensive coverage of the literature of psychiatry, psychology and related disciplines. Use PsycINFO when you want to search for: mental health, psychiatry and psychology (primary subjects).

 **READ MORE.** Visit the South East Library Service website and click on the HELP tab to view a large selection of printed user guides, helpsheets and tutorials, as well as short (3- or 4-minute) online tutorials on various resources. See especially:

- Your 10-Step Guide to CINAHL at <http://www.hselibrary.ie/southeast/download/12>
- Your 10-Step Guide to MEDLINE at <http://www.hselibrary.ie/southeast/download/15>
- Your 10-Step Guide to PsycINFO at <http://www.hselibrary.ie/southeast/download/16>
- the online tutorials An Introduction to CINAHL, CINAHL Advanced Search and MEDLINE at <http://www.hselibrary.ie/southeast/help/#tutorials>

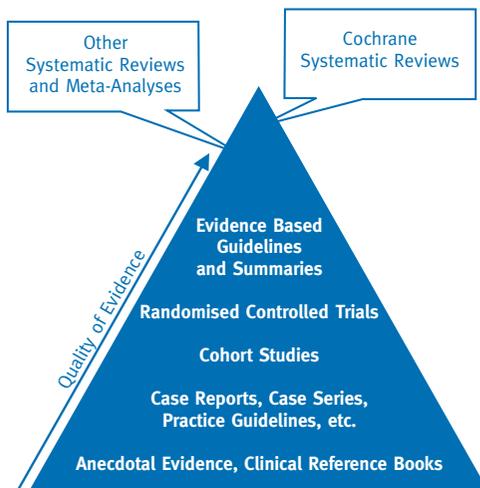


**peer-reviewed:** the evaluation of studies done by one or more authors by people of similar professional competence. The peer review process is intended to maintain standards of quality and provide credibility



## PYRAMID OF EVIDENCE<sup>11</sup>

Within the literature, studies are often categorised according to the “Pyramid of Evidence,” with the quality of evidence strengthening as you move from the base to the apex of the pyramid.



Begin your search at the top of the pyramid with systematic reviews from the Cochrane Library. Go to <http://www.hslibrary.ie/southeast> and click on the Cochrane Library resource link which appears centre screen.

📖 **READ MORE.** There is a user guide on some of the basics of browsing and searching the Cochrane Library available at <http://www.hslibrary.ie/southeast/download/28>.

Cochrane and other systematic reviews can also be found in MEDLINE. Conduct your subject search as normal and at the end apply the following search options:

“EBM Reviews” to locate systematic reviews from the Cochrane Database of Systematic Reviews

“Publication Type = Meta-Analyses” to locate meta-analyses

“Subject Subset = Systematic Reviews” to locate all systematic reviews from Cochrane and elsewhere

“Review Articles” to locate both systematic reviews and meta-analyses

<sup>11</sup> Adapted from: University of Washington Health Sciences Libraries, “Evidence-Based Practice Tools,” <http://libguides.hsl.washington.edu/ebptools>. Accessed 24 March 2014.

📖 **READ MORE.** See Your 10-Step Guide to MEDLINE at <http://www.hselibrary.ie/southeast/download/15>. See especially “Step 8: Search Options” to apply the various search limits above.

UpToDate is an excellent source of evidence-based guidelines and summaries. Go to <http://www.hselibrary.ie/southeast> and click on the UpToDate resource link centre screen. UpToDate is extremely useful as it includes synopses and interpretation of the best available evidence on almost 10,000 clinical topics. Topics are continuously reviewed and updated to ensure that the most current evidence is included.

📖 **READ MORE.** Visit the South East Library Service website and click on the HELP tab. See the online tutorial UpToDate at <http://www.hselibrary.ie/southeast/help/#tutorials>.

To locate randomised controlled trials, conduct a MEDLINE subject search as normal and at the end apply the search option “Publication Type = Randomised Controlled Trial.”

📖 **READ MORE.** See “Step 8: Search Options” of Your 10-Step Guide to MEDLINE at <http://www.hselibrary.ie/southeast/download/15>.

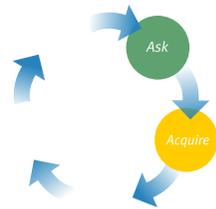
To locate cohort studies, conduct a MEDLINE subject search and at the end combine your results with the exploded subject “Cohort Studies.” Combine with AND.

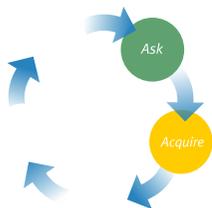
📖 **READ MORE.** See “Step 6: Combine Searches” of Your 10-Step Guide to MEDLINE at <http://www.hselibrary.ie/southeast/download/15>.

The National Institute for Health and Clinical Excellence (NICE) in Britain and the National Guideline Clearinghouse in the United States are excellent sources of clinical guidelines. Go to <http://www.hselibrary.ie/southeast> and click on the relevant resource link centre screen.

Contact the library to source clinical reference books relevant to your subject or go to <http://www.hselibrary.ie/southeast> and enter your keywords in the Ebsco Discovery search box. Select the “Catalog Only” tick-box.

📖 **READ MORE.** See the user guide Ebsco Discovery Service (EDS): Search Box at <http://www.hselibrary.ie/southeast/download/29>.





## CLINICAL QUERIES

The South East Library Service provides a Clinical Queries service to all HSE employees in Carlow, Kilkenny, South Tipperary, Waterford and Wexford. The service is based on the first two steps in the EBP process:

- Ask an answerable question
- *Acquire* the best evidence appropriate to your question

Questions may be submitted by completing an easy-to-use online form at <http://www.hselibrary.ie/southeast>. Click on the Clinical Queries tab and complete your contact details together with the details of your question. Alternatively, a request may be made by phoning (056)7784174/4259 or by emailing [Clinical.Queries@hse.ie](mailto:Clinical.Queries@hse.ie).

Once your question has been received, the library service will:

- analyse your question into PICO(T) components
- assign a question type: Intervention, Aetiology, Diagnosis, etc.
- conduct a detailed subject search of the most relevant primary database: MEDLINE for medical questions; CINAHL for questions related to nursing or allied health; PsycINFO for questions related to mental health
- conduct secondary keyword searches of other relevant resources
- collate a selection of results and return to you with details of the search strategy used and resources searched

*“This initiative is a most welcome tool now available for busy clinicians trying to arm themselves with the latest developments and evidence for quality clinical decision making.”*

Professor J.F. Jackson, Waterford Regional Hospital

## SAMPLE SEARCH STRATEGY<sup>12</sup>

*What is your clinical question?*

Are women with asthma at increased risk of pregnancy complications?

*What is the PICO(T) of this question?*

- **Population:** pregnant women
- **Indicator:** asthma
- **Comparator:** N/A
- **Outcome:** pregnancy complications
- **Time:** gestation and – potentially – ongoing

*What is the question type?*

Aetiology/Risk Factors

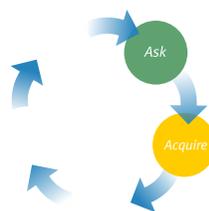
*What type of study will best answer an aetiology/risk factor question?*

A randomised control trial, a cohort study or a case-control study

In order to build a search strategy from your clinical question, use subject headings and synonyms to pinpoint two or three of your PICO(T) components. Combine these components to retrieve more accurate and relevant results. You wish to investigate whether women with asthma are at increased risk of pregnancy complications. Use PICO(T) to divide your search into key concepts. It is important to remember that you will seldom need to enter all four components into your search. There may be no comparator (C) or the outcome (O) may be contained in your search results.

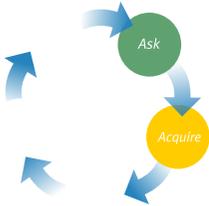
Search for the subject heading “Asthma.” Subject headings provide a consistent way to retrieve search results where different authors may have used different terminology for the same concept. It is usually a good idea to select EXPLODE (see screenshot on p18) to retrieve results including your subject term and all of its more specific sub-headings.

Search for any synonyms or keywords associated with your subject heading: eg *wheeze, shortness of breath*, etc. Use



<sup>12</sup> This sample search is compiled using the MEDLINE database.

# STEP 2

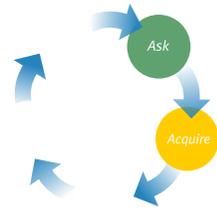


## SUBJECT SEARCHING

HSE South East Library

The screenshot shows the EBSCO eBooks interface for a search on 'Asthma'. At the top, there are navigation links: 'Database: ?', 'Basic Search', 'Advanced Search', and 'Search History'. Below these are 'Mesh' and 'View Tutorials' options. The main content area is titled 'Results for asthma' and includes a 'Check box to view your subheadings' and a 'Check related item for this view' link. A green bar highlights the 'Subheadings for Asthma' section, which contains several subheadings with checkboxes: 'Asthma' (checked), 'Asthma-Associated Disorders', 'Bloodstain', and 'Cardiorespiratory Practice'. A callout box labeled 'Click SEARCH DATABASE.' points to the search bar. Another callout box labeled 'Select EXPLODE.' points to the 'Explosive (+)' button. A third callout box labeled 'Search Database' points to the search results area, which includes a 'Search Term' field containing 'Asthma', a 'Major Concept' dropdown, and an 'Explosive (+)' button.

nouns as keywords in your search. Verbs are often ignored or discarded by search engines. Combine synonyms of your keywords with OR: *asthma OR wheezing OR shortness of breath*. The inclusion of synonyms can increase the number of relevant results by 50%.



Use the truncation symbol \* to retrieve different word endings: *asthma\**, *wheez\**. Truncation saves you having to list all possible variants of a keyword: eg *wheez\** will retrieve results including *wheeze*, *wheezing*, *wheeziness*, etc.

Where possible, enclose phrases with quotation marks. Quotation marks limit results to exact matches of the phrase and target more relevant information: eg *"shortness of breath"* searches for the exact phrase and not simply pages with the words *shortness* and *breath*.

Search for the subject heading "Pregnancy" and once again choose EXPLODE to include more specific sub-headings.

Search for any synonyms or keywords associated with the subject heading "Pregnancy."

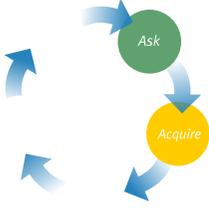
Arrange different keywords or phrases into concept groups using brackets. Many search engines interpret your question from left to right, so place the most important concept groups on the left-hand side of your sentence, followed by the next most important, etc.: (*asthma\* OR wheez\* OR "shortness of breath" OR breathless\**) AND (*pregnant OR pregnancy*).

Use the SEARCH HISTORY panel to combine your searches.

Always combine searches with AND if you wish to retrieve journal articles that contain both of your keywords. Combine searches with OR to retrieve journal articles that contain either of your keywords.

In the search history below, search 1 (S1: the subject heading "Asthma") and search 2 (S2: all of the synonyms associated with the subject heading) are combined with OR. The pooled results are listed as search 3 (S3).

# STEP 2



## SEARCH HISTORY

Select / deselect all   
    
    

| Search ID# | Search Terms  | Search Options  | Actions                                |
|------------|---|---|--|
| S10        | S3 AND S6   | Limiters - Subject Subset: Systematic Reviews, Publication Type: Meta-analysis                  | <a href="#">View Results (18)</a>      |
| S9         | S3 AND S6   | Limiters - Date of Publication: 20070101-20130231<br>Narrow by Subjectage: - adult: 19-44 years | <a href="#">View Results (501)</a>     |
| S8         | S3 AND S6   | Limiters - Date of Publication: 20070101-20130231   | <a href="#">View Results (1,453)</a>   |
| S7         | S3 AND S6   |   | <a href="#">View Results (3,307)</a>   |
| S6         | S4 OR S5<br>pregnant OR pri                             |   | <a href="#">View Results (770,009)</a> |
| S5         | (MH "Pregnancy"*)                                       |   | <a href="#">View Results (755,791)</a> |
| S4         | S1 OR S2  |   | <a href="#">View Results (693,094)</a> |
| S3         | adult OR wheel* OR "shortness of breath" OR breathless* |   | <a href="#">View Results (148,790)</a> |
| S2         | (MH "Adipositas"*)                                      |   | <a href="#">View Results (148,790)</a> |
| S1         | (MH "Adipositas"*)                                      |   | <a href="#">View Results (102,461)</a> |

S9: search results are further limited by age group.

The results of S4 and S5 are pooled to give S6.

The results of S1 and S2 are pooled to give S3.

S10: search results are further limited to systematic reviews and meta-analyses.

S8: search results are limited by date range (2007 - present).

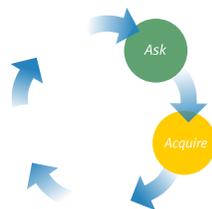
S7: both sets of pooled results are combined with AMD.

Similarly, search 4 (S4: the subject heading “Pregnancy”) and search 5 (S5: the keywords *pregnant* and *pregnancy*) are combined with OR. The pooled results are listed as search 6.

Here, you wish to retrieve journal articles that discuss both asthma and pregnancy. Select both sets of pooled results and click SEARCH WITH AND.

Use SEARCH OPTIONS on the left-hand panel to limit your results. In search 8 - S8 on the SEARCH HISTORY graphic on page 20 - results are limited by date range: 2007 – present. In search 9 (S9), results are further limited by age group. In search 10 (S10), results are further limited to systematic reviews or meta-analyses to target studies at the apex of the pyramid of evidence.

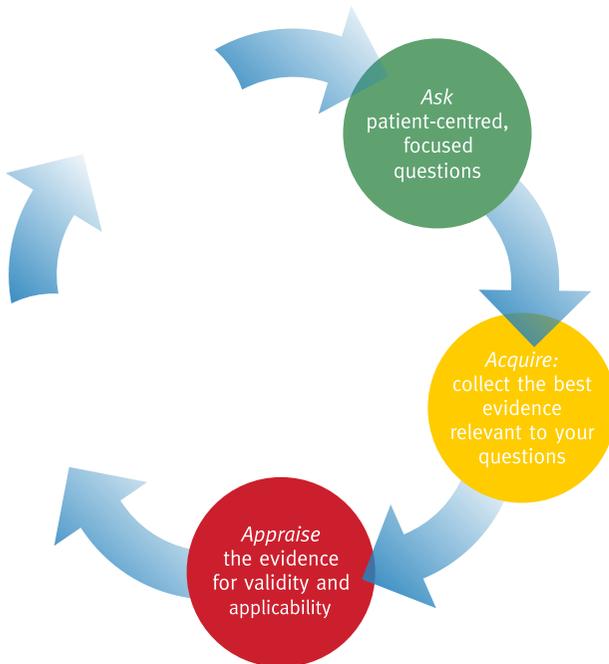
 **READ MORE.** Visit the [South East Library Service website](#) and click on the **HELP** tab to view a large selection of printed user guides, helpsheets and tutorials, as well as short (3- or 4-minute) online tutorials on various resources.

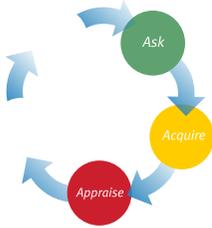




# STEP 3

*Appraise* the evidence for validity and applicability





## HOW DO I CRITICALLY APPRAISE THE EVIDENCE?

Now that you have acquired evidence relevant to your question, it is necessary to assess the quality, design and applicability of that evidence. Critical appraisal is the process of carefully and systematically examining research to judge its trustworthiness, its value and its relevance in a particular context.

Critical appraisal of the evidence involves three components. Ask yourself:

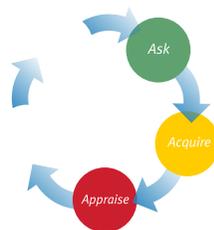
- What is the PICO(T) of the study and is it close enough to the PICO(T) of your clinical question?
- How well was the study done? Is the quality of the study good enough to produce results that can be used to inform clinical decisions?
- What are the results and are they applicable to your patients and your clinical setting?

📖 READ MORE. See Ajetunmobi, O., *Making Sense of Critical Appraisal* (London: Arnold, 2002).

📖 READ MORE. See Greenhalgh, T., *How to Read a Paper: The Basics of Evidence-Based Medicine* (Chichester: Wiley-Blackwell, 2010).

📖 READ MORE. See Craig, J.V. and Smith, R.L., *The Evidence-Based Practice Manual for Nurses* (Edinburgh: Churchill Livingstone, 2007).

## WHAT IS THE PICO OF THE STUDY, AND IS IT CLOSE ENOUGH TO YOUR PICO?



A study will rarely correspond exactly to your clinical question. You must decide whether it is close enough to help answer your question: is the PICO of the study similar to the PICO of your clinical question? Consider each element of your PICO in relation to the study you have retrieved. For example, is the population in the study similar to your patient or population? What outcomes are measured in the study and do they correspond with the outcomes you are most concerned about achieving or preventing?

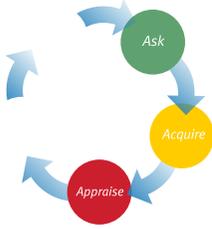
Once you have decided that the PICO of the study is close enough to the PICO of your clinical question, you may proceed to the next question in the critical appraisal process.

## HOW WELL - OR HOW BADLY - WAS THE STUDY CONDUCTED?

The quality or internal validity of a study may be gauged by asking yourself to what extent the research methods used minimised bias or other confounding factors.

Bias may be defined as the systematic deviation of the results of a study from the truth because of the way it has been conducted, analysed or reported. Bias occurs when “systematic error is introduced into sampling or testing by selecting or encouraging one outcome or answer above others.”<sup>13</sup> Bias can occur at any phase of a study from study design to data collection and interpretation. Some examples of bias are set out in the table on page 26.

13 Cited in Panucci, C. and Wilkins, E., “Identifying and Avoiding Bias in Research,” *Plastic and Reconstructive Surgery*, 126(2), 2010, 1.



**bias:** the systematic introduction of error into sampling or testing by selecting or encouraging one outcome or answer above others

**confounding:** the distortion of the true effect of a treatment, exposure or risk factor by other factors that vary from the study group to the control group. Randomisation helps to eliminate confounding factors because the act of randomisation distributes all confounders – both known and unknown – fairly

| Bias Type                  | Description  |
|----------------------------|--|
| Selection or Sampling Bias | Systematic differences between those selected to participate in a study and those not selected.              |
| Allocation Bias            | Systematic differences in the allocation of participants to intervention and control groups.                 |
| Attrition Bias             | Participants withdrawing from a study may differ systematically between intervention and control groups.     |
| Measurement Bias           | Systematic differences in the measurement of an exposure or outcome between intervention and control groups. |

Table 4: Types of Bias <sup>14</sup>

Bias cannot be limited to a simple question: “*Is bias present or not?*” Instead, you must consider the degree to which bias was prevented by proper study design and implementation. There is no perfect study. As some degree of bias is nearly always present in a published study, you must consider to what extent bias may have influenced the results of a study.

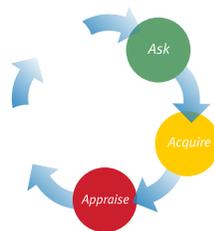
To determine how well bias and confounding factors have been avoided, each aspect of the study should be carefully scrutinised. Ask yourself:

- How were the subjects recruited?
- How were the subjects allocated to groups?
- How were the study groups maintained? Was there equal management and follow-up of subjects?
- How were outcomes measured?

📖 **READ MORE.** For a more detailed analysis of bias and other confounding factors, see Hoffmann, T., Bennett, S. and Del Mar, C., *Evidence-Based Practice across the Health Professions* (Edinburgh: Churchill Livingstone, 2013).

<sup>14</sup> Adapted from Hoffmann, T., Bennett, S. and Del Mar, C., *Evidence-Based Practice across the Health Professions* (Edinburgh: Churchill Livingstone, 2013), 31.

## WHAT ARE THE RESULTS AND ARE THEY APPLICABLE TO MY PATIENTS AND MY CLINICAL SETTING?



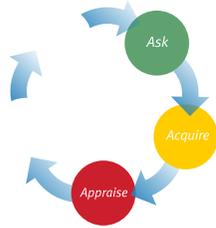
When you decide that the internal validity of a study is adequate and that bias and other confounding factors have been avoided, you need to closely examine the results of the study.

Ask yourself:

- Are your patients similar enough to those in the study population that the results are applicable to your clinical setting?
- Did the intervention have a large enough effect on the clinical outcome(s) of interest that you would consider altering your practice and using the new intervention?
- What resources – human, financial, time – are needed to implement a change in clinical practice?

## CRITICAL APPRAISAL CHECKLIST

On the following pages you will find sample critical appraisal guides for randomised controlled trials and systematic reviews.



### How large is the treatment effect?

Consider a study in which 15% (0.15) of the control group and 10% (0.1) of the treatment group died after 2 years of an intervention. Results may be expressed in many ways, including: relative risk, absolute risk reduction, relative risk reduction and number needed to treat.

**relative risk (RR):** the risk or probability of an event in the intervention group divided by that in the control group. A relative risk of 1 means that there is no difference between the groups. A relative risk <1 indicates benefit from the intervention.

In our example, the  $RR = 0.1 \div 0.15 = 0.67$ . Since the  $RR < 1$  the intervention reduces the risk of death.

**absolute risk reduction (ARR):** the absolute arithmetic difference between the intervention and control groups. An absolute risk reduction of 0 means that there is no difference between the groups and that the treatment had no effect.

In our example, the  $ARR = 0.15 - 0.1 = 0.05$  or 5%. The absolute benefit of treatment is a 5% reduction in the death rate.

**relative risk reduction (RRR):** the proportional reduction of an event in the treatment compared to the control group. The easiest way to calculate relative risk reduction is to subtract the relative risk from 1. In our example, the  $RRR = 1 - 0.67 = 0.33$ .

## Critical Appraisal of Randomised Controlled Trials<sup>15</sup>

### Preliminary Details

Author(s)

Title

Source

Is the trial relevant to my clinical question? Yes  No  Can't Tell

Does the trial address a clearly focused question? Yes  No  Can't Tell

### Was the assignment of patients to study and control groups randomised?

| What's best?   | Where do I find the information?  | In this study?   |
|--|---|--|
| Centralised computer randomisation is the gold standard and often used in multi-centre trials. Smaller studies may use an independent person to monitor randomisation. | The METHODS section should describe how patients were allocated to groups and whether or not randomisation was concealed. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can't Tell <input type="checkbox"/> |

### Were study and control groups similar at the start of the trial?

| What's best?   | Where do I find the information?  | In this study?   |
|--|---|--|
| If randomisation is successful both groups should be similar. The trial should state whether differences are statistically significant: ie p-values. | The RESULTS section should include baseline characteristics comparing groups against a number of variables: age, risk factors, etc. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can't Tell <input type="checkbox"/> |

### Apart from the intervention under investigation, were both groups treated equally?

| What's best?  | Where do I find the information?  | In this study?   |
|---|---|--|
| Apart from the intervention, both groups should be treated equally. | Look in the METHODS section for a follow-up schedule and permitted additional treatments. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can't Tell <input type="checkbox"/> |

### Were all patients accounted for and analysed in the groups to which they were originally allocated?

| What's best?   | Where do I find the information?   | In this study?   |
|--|--|--|
| Losses to follow-up should be minimal (<20%). Patients should be analysed in the groups to which they were randomised: ie intention to treat analysis. | The RESULTS section should state how many patients were randomised and how many were included in the analysis. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can't Tell <input type="checkbox"/> |

<sup>15</sup> Adapted from the Centre for Evidence-Based Medicine "RCT Critical Appraisal Sheet" at <http://www.cebm.net/?o=1040>. Accessed 04 December 2013.

Were measures objective or were participants and clinicians kept “blind” to which treatment was being received.

| What’s best?  | Where do I find the information?   | In this study?   |
|---|--|--|
| Ideally, the study should be double blinded: ie both patients and researchers do not know the treatment allocation. If the outcome is objective - eg death - blinding is less important; if the outcome is subjective - eg symptoms - blinding is critical. | Look in the METHODS section to see if there is mention of masking of treatments. The METHODS section should describe how the outcome was assessed and whether or not the researchers are aware of the patients’ treatment. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can’t Tell <input type="checkbox"/> |



**number needed to treat (NNT):** the number of people that need to be treated in order to achieve an event once. An intervention with a smaller NNT is more effective. Clinical significance may be determined by considering the NNT and weighing against potential adverse effects of treatment. The number needed to treat is calculated as the inverse of ARR or  $1 \div \text{ARR}$ .

In our example, the  $\text{NNT} = 1 \div 0.05 = 20$ . It would be necessary to treat 20 people for 2 years to prevent 1 death.

**confidence interval:** an estimate of the range of values that will include the real value. A confidence interval of 95% means that there is a 95% chance that the real value is included in the study results

**p-values:** a measure of the probability that a result is purely due to chance. A low p-value suggests that the result was not simply a chance occurrence

How large is the treatment effect?

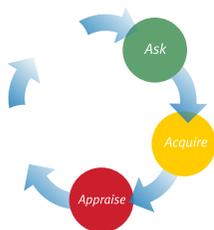
|   |                                    |
|---|------------------------------------|
| Results may be expressed in many ways, including: relative risk, absolute risk reduction, relative risk reduction and number needed to treat. | How large is the treatment effect? |
|---|------------------------------------|

How precise is the estimate of treatment effect?

|  |                                    |
|--|------------------------------------|
| We can gauge how close the estimate of treatment effect is to the true value by looking at confidence intervals. | What are the confidence intervals? |
|--|------------------------------------|

Are the results applicable in my clinical setting?

|  |  |
|--|--|
|  | <p>Are my patients similar enough to those in the study?</p> <p>Is the treatment feasible/affordable?</p> <p>Are the potential benefits worth the potential risks to the patient and/or costs involved in implementing a change in practice?</p> |
|--|--|



**heterogeneity:** the amount of major difference or incompatibility between studies included in a systematic review

## Critical Appraisal of Systematic Reviews<sup>16</sup>

### Preliminary Details

Author(s)

Title

Source

Is the review relevant to my clinical question? Yes  No  Can't Tell

Does the review address a clearly focused question? Yes  No  Can't Tell

### What question - PICO(T) - did the systematic review address?

| What's best?  | Where do I find the information?   | In this study?   |
|---|--|--|
| The question should be clearly stated.<br>The exposure - eg a therapy or diagnostic test - and outcomes of interest are often expressed as a simple relationship. | The title, abstract or last paragraph of the introduction should clearly state the question. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can't Tell <input type="checkbox"/> |

### Is it safe to say that important, relevant studies were not missed?

| What's best?  | Where do I find the information?   | In this study?   |
|---|--|--|
| A comprehensive search strategy should include subject searching of all relevant databases, manual searching of reference lists and contact with experts. Searches should not be limited to English language only. A combination of subject headings and keywords should be used. | The METHODS section should describe the search strategy. The RESULTS section should indicate the number of studies reviewed and excluded - with reasons for exclusion. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can't Tell <input type="checkbox"/> |

### Were the criteria used to select articles for inclusion appropriate?

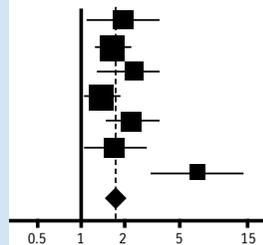
| What's best?  | Where do I find the information?  | In this study?   |
|---|---|--|
| The inclusion or exclusion of studies should be clearly predefined. Eligibility criteria should be formulated on the basis of the patients, interventions and outcomes of interest. In many cases, study design will also be a key component. | The METHODS section should describe in detail inclusion and exclusion criteria. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can't Tell <input type="checkbox"/> |

16 Adapted from the Centre for Evidence-Based Medicine "Systematic Review Critical Appraisal Sheet" at <http://www.cebm.net/index.aspx?o=1567>. Accessed 04 December 2013.

Were included studies sufficiently valid?

| What's best?  | Where do I find the information?  | In this study?   |
|---|---|--|
| The article should describe how the quality of each study was assessed using predetermined criteria appropriate to the type of clinical question: eg randomisation, blinding and completeness of follow-up. | The METHODS section should describe the assessment of quality and criteria used. The RESULTS section should provide information on the quality of the individual studies. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can't Tell <input type="checkbox"/> |

How do I interpret a forest plot?



Were the results similar from study to study?

| What's best?   | Where do I find the information?   | In this study?   |
|--|--|--|
| Ideally, the results of included studies should be similar or homogenous. If heterogeneity is present, statistical significance should be estimated and possible reasons explored. | The RESULTS section should state whether or not the results are heterogeneous. To identify heterogeneity, you may visually assess the forest plot or perform a statistical test: the chi-squared test. | Yes <input type="checkbox"/><br>No <input type="checkbox"/><br>Can't Tell <input type="checkbox"/> |

Individual studies are represented by a square and a horizontal line. The horizontal line represents the confidence interval (CI) of the study, with a longer horizontal line indicating a wider margin of error. The black square is an estimate of the intervention effect measured against the x-axis scale at the base of the forest plot. The size of the black square corresponds to the weight of the study in the meta-analysis.

What are the results?

A systematic review provides a summary of data from a number of individual studies. If individual studies are similar, a statistical method called meta-analysis is used to combine results. The meta-analysis gives weighted values to each study according to its size. The results of individual studies should be expressed in a common way - eg relative risk, odds ratio or mean difference between groups - and are normally displayed in a figure called a forest plot.

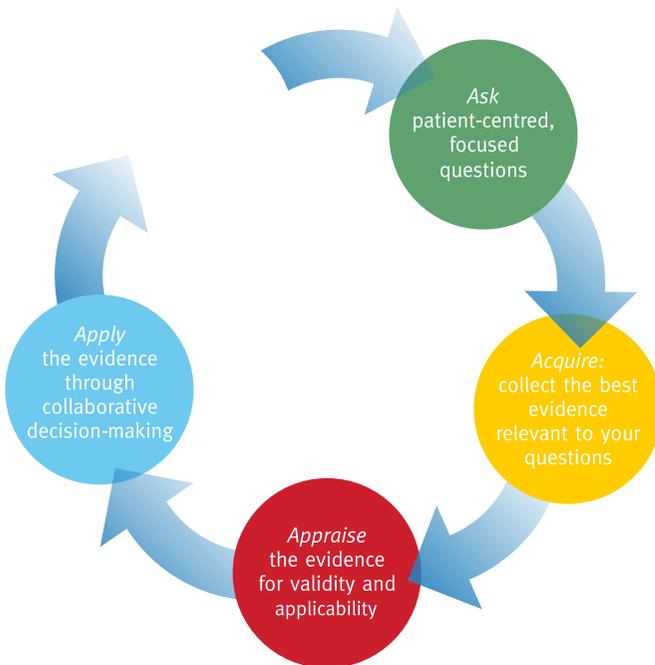
The central vertical line is the line of no effect: ie the point at which there is no difference between the intervention and the control. When the horizontal line of any individual study intersects the central vertical line, the result is not statistically significant and may be discounted.

The diamond at the base of the forest plot represents the aggregate results of all studies included in the meta-analysis. When the diamond does not intersect the line of no effect, the results are statistically significant and the benefit of the intervention may be measured against the x-axis scale at the base of the forest plot.



# STEP 4

*Apply* the evidence through collaborative decision-making





## WHY IMPLEMENT EVIDENCE-BASED PRACTICE?

To achieve a measurable improvement in:

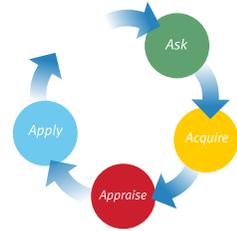
- quality of patient care
- consistency of patient care
- patient outcomes
- cost containment

EBP is the accepted standard in modern healthcare systems and increasingly recognised as a core clinical competency. Internationally, several regulatory agencies have emphasised the importance of using scientific evidence to guide clinical decisions as a means of improving patient outcomes.

To improve patient outcomes, healthcare professionals need to do more than acquire and appraise best evidence: implementing evidence into practice is also required. Implementing the evidence is a complex and active process involving individuals, teams, systems and organisations, and requires careful planning.

📖 [READ MORE](#). Hoffmann, T., Bennett, S. and Del Mar, C., *Evidence-Based Practice across the Health Professions* (Edinburgh: Churchill Livingstone, 2013).

# HOW TO FACILITATE THE IMPLEMENTATION OF EVIDENCE-BASED PRACTICE<sup>17</sup>

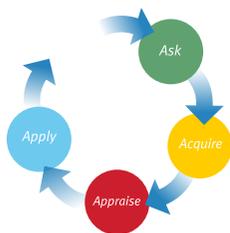


Several models have been developed to guide healthcare professionals in the successful implementation of evidence into practice.

| Selected Models   |  |
|---|--|
| <b>Johns Hopkins Model (2005)</b>   | A change model which progresses from identification of an EBP question to recruiting and assembling a team; from acquiring, appraising and summarising the evidence to framing practice recommendations; from implementing and evaluating change to communication of findings.           |
| <b>Stetler Model (2001)</b>   | A focused model in 5 phases: preparation of research evidence; validation of findings; synthesis of cumulative findings and decision on whether or not to implement a change in practice; translation and practical application of findings; and evaluation as part of routine practice. |
| <b>Iowa Model (2001)</b>  | An organisational model which includes: evaluation of knowledge- and problem-focused triggers; gathering and critique of evidence; decision on whether or not a change in practice is appropriate; and evaluation of structures, processes and outcomes.                                 |
| Common Elements   |  |
| <ul style="list-style-type: none"> <li>▪ identify a clinical problem</li> <li>▪ acquire best evidence</li> <li>▪ critically appraise the evidence</li> <li>▪ DECISION: should a change in practice be implemented?</li> <li>▪ plan and implement practice change</li> <li>▪ assess outcomes and adjust practice as necessary</li> </ul> |  |

Table 5: Models for Implementation of EBP

<sup>17</sup> Adapted from Schub, E., "Evidence-Based Nursing Practice: Implementing," *CINAHL Nursing Guides* (Glendale, CA: CINAHL Information Systems, 2012).



Another common theme among implementation models is the challenge of realising change within the social or organisational constraints of a given clinical setting. Strategies that have been successfully applied in healthcare organisations include the involvement of EBP mentors, the use of clinical library services and journal clubs, and the provision of education and promotion through in-service training, email bulletins, newsletters, etc. Muir Gray also identifies the support of a librarian or information scientist and access to electronic resources as necessary support structures to the implementation of EBP.<sup>18</sup>

Hospital or health service administrators must agree that best evidence should at each stage inform and underpin patient care, and provide financial and other resources to support EBP, such as:

- access to ICT and adequately resourced library services for the purposes of acquiring reliable evidence
- allocation of healthcare professionals to provide in-service education sessions and mentoring programmes
- time allocated to release clinicians to work with a librarian in accumulating and synthesising the evidence and/or attend education sessions
- funding to permit all of the above points.

Strong clinical leadership is essential to encourage and sustain a culture of enquiry, collegiality and evidence-based practice.

<sup>18</sup> Muir Gray, J.A., *Evidence-Based Healthcare and Public Health* (Edinburgh: Churchill Livingstone, 2009), 16.

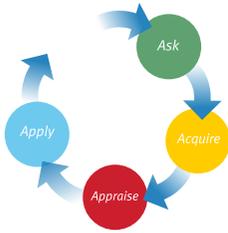
# FACILITATORS AND BARRIERS TO THE IMPLEMENTATION OF EBP



| Identified Facilitators of the Implementation of EBP  | Identified Barriers to the Implementation of EBP  |
|---|---|
| <ul style="list-style-type: none"> <li>▪ organisational culture which demonstrates active support for EBP</li> <li>▪ provision of EBP education for clinicians and managers</li> <li>▪ availability of EBP mentors</li> <li>▪ availability of clinical library services</li> <li>▪ presence within the organisation of EBP champions who will support clinical teams</li> </ul> | <ul style="list-style-type: none"> <li>▪ absence of organisational support for EBP</li> <li>▪ knowledge deficits relating to EBP</li> <li>▪ absence of EBP mentors</li> <li>▪ negative or apathetic attitude toward EBP</li> <li>▪ inadequate access to ICT and/or clinical library services</li> </ul> |

Table 6: Facilitators and Barriers to the Implementation of EBP

 [READ MORE](#). Schub, E., "Evidence-Based Nursing Practice: Implementing," *CINAHL Nursing Guides* (Glendale, CA: CINAHL Information Systems, 2012).



## SAMPLE IMPLEMENTATION WORKFLOW

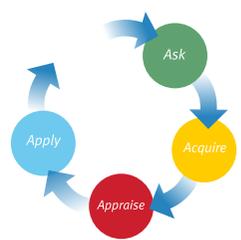
The template on page 39 sets out a series of steps – based on the five steps of EBP – that may be used to successfully implement an evidence-based practice change. Not all of the steps are required for each change in practice.

**clinical audit:** a quality improvement process which measures patient care against explicitly predefined criteria and implements changes based on results; where indicated, changes are implemented at unit, hospital or system level and further monitored to confirm quality improvement

**audit and feedback:** the process of audit and feedback is one method which may be used to demonstrate the benefit of an EBP intervention; it may be defined as “any summary of clinical performance over a specified period of time aimed at providing information to allow [healthcare professionals] assess and adjust their performance.” An audit may focus on an intervention such as a drug prescription, diagnostic test or compliance with clinical guidelines; it provides necessary performance indicators on the intervention and, importantly, on patient outcomes. Ongoing audits are often required to verify that the intervention has been accepted into practice as the norm.

📖 **READ MORE.** Flottorp, S.A. et al., *Using Audit and Feedback to Health Professionals to Improve the Quality and Safety of Health Care* (Copenhagen: World Health Organization, 2010).

📖 **READ MORE.** Houser, J. and Oman, K.S., *Evidence-Based Practice: An Implementation Guide for Healthcare Organizations* (Sudbury, MA: Jones and Bartlett, 2011), 211-212.



| EBP Change: Implementation Checklist <sup>19</sup>  |  |                          |                          |
|---|--|--------------------------|--------------------------|
| EBP Step  |  | YES                      | NO                       |
| ■ Step1   | <ul style="list-style-type: none"> <li>Ask a clinical question relevant to the patient group, ward or unit.</li> </ul>   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step1   | <ul style="list-style-type: none"> <li>Divide your question into PICO(T) components.</li> </ul>  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step2   | <ul style="list-style-type: none"> <li>Acquire the best evidence from reliable sources.</li> </ul>   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step3   | <ul style="list-style-type: none"> <li>Critically appraise and synthesise the evidence.</li> </ul>   | <input type="checkbox"/> | <input type="checkbox"/> |
|   | <ul style="list-style-type: none"> <li>DECISION: Does the evidence imply a change in practice? If YES, continue. If NO, consider another</li> </ul>  | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>At this point, it is anticipated that the group are working collaboratively with all relevant disciplines.</b> |  |                          |                          |
| ■ Step4   | <ul style="list-style-type: none"> <li>Assess the specific area of clinical practice to get a baseline measure of current status.</li> </ul>   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>Agree the scope of practice change to be implemented: how do you envisage the changed practice operating after a month? after 6 months? after 18 months?</li> </ul> | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>Agree a simple audit plan to measure progress, assess patient outcomes and monitor compliance.</li> </ul>   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>Agree the duration of a test phase.</li> </ul>  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>As part of the test phase, calculate the costs involved in the proposed change in practice.</li> </ul>  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>Agree how the practice change will be communicated to all involved in implementation.</li> </ul>  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>Provide education to healthcare professionals on the rationale for the change in practice and how it will be achieved.</li> </ul>                                   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>On completion of the test phase, view the results of your audit.</li> </ul>   | <input type="checkbox"/> | <input type="checkbox"/> |
|   | <ul style="list-style-type: none"> <li>DECISION: Do audit results imply a change in practice? If YES, continue. If NO, conclude project.</li> </ul>  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>Distribute audit results to ward or unit colleagues.</li> </ul>   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>Amend policies and procedures to account for the practice change.</li> </ul>  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4   | <ul style="list-style-type: none"> <li>Distribute email bulletins, flyers, etc., to publicise the practice change.</li> </ul>  | <input type="checkbox"/> | <input type="checkbox"/> |

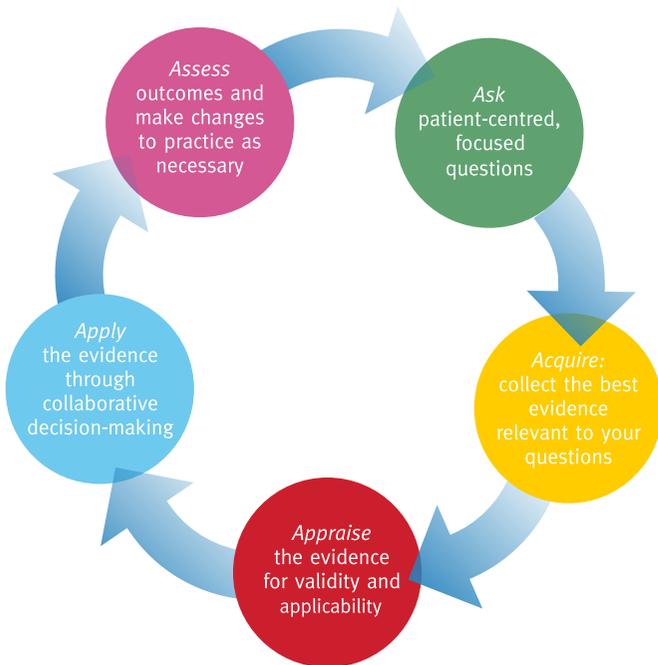
Table 7: Implementation Checklist

19 Adapted from Schub, E., "Evidence-Based Nursing Practice: Implementing," *CINAHL Nursing Guides* (Glendale, CA: CINAHL Information Systems, 2012).



# STEP 5

Assess outcomes and make changes to practice as necessary



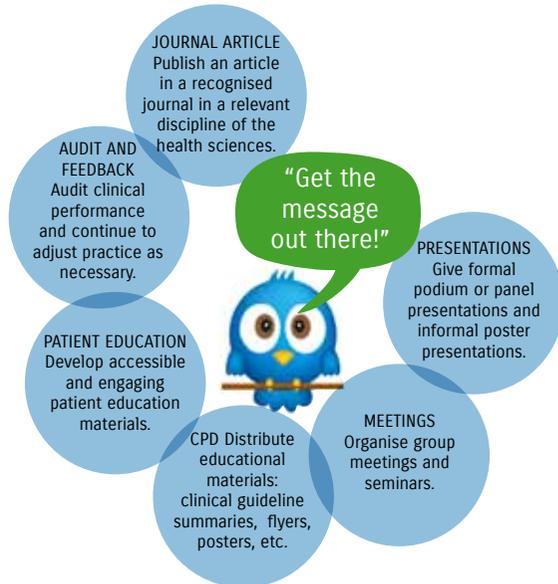


After an evidence-based practice change has been implemented, the final step in the EBP cycle involves assessing outcomes, disseminating results and making further changes to practice as necessary or as prompted by new evidence.

Rengerink et al.: “Tools measuring EBP behaviour of healthcare professionals should assess the use of EBP steps in practice, the performance of evidence-based clinical [procedures] and/or the effect of EBP on patient outcomes.”<sup>20</sup> All five steps in the EBP process should be considered as part of any assessment.<sup>21</sup>

[READ MORE.](#) Rengerink, K.O. et al, “Tools to Assess Evidence-Based Practice Behaviour among Healthcare Professionals,” *Evidence-Based Medicine*, 18 (4), 2013, 129-138.

Disseminating the results of an EBP intervention may be accomplished in several ways:



20 Rengerink, K.O. et al., “Tools to Assess Evidence-Based Practice Behaviour among Healthcare Professionals,” *Evidence-Based Medicine*, 18 (4), 2013, 132.

21 Tilson, J.K., Kaplan, S.L. and Harris, J.L., “Sicily Statement on Classification and Development of Evidence-Based Practice Learning and Assessment Tools,” *BMC Medical Education*, 11 (10), 78.

# ASSESS YOUR OWN EBP PERFORMANCE



Self-assessment should be an integral part of the continuous cycle of EBP. The checklist below sets out some of the questions you might consider:

| EBP Self-Assessment Checklist <sup>22</sup> |   |                          |                          |
|---|---|--------------------------|--------------------------|
| EBP Step                                    |   | YES                      | NO                       |
| ■ Step1                                     | ▪ Am I asking any clinical questions?   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step1                                     | ▪ Am I actively locating evidence/ practice gaps and articulating questions based on same?                                      | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step1                                     | ▪ Are my questions analysed into PICO(T) components?  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step2                                     | ▪ Have I secured immediate access to best evidence via the South East Library Service?  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step2                                     | ▪ Do I search the sources of best evidence in my clinical discipline?   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step2                                     | ▪ Do I use subject headings, limiters and intelligent keywords when searching the main databases: CINAHL, MEDLINE and PsycINFO? | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step2                                     | ▪ Do I use the Clinical Queries service?  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step3                                     | ▪ Do I critically appraise the evidence?  | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4                                     | ▪ Do I integrate critical appraisal measures<br>– risk ratios, NNTs, etc. – into my own practice?                               | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4                                     | ▪ Do I adjust critical appraisal measures to the circumstances of my own clinical setting?                                      | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4                                     | ▪ Have I implemented an evidence-based practice change?   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step4                                     | ▪ Have I audited the practice change?   | <input type="checkbox"/> | <input type="checkbox"/> |
| ■ Step5                                     | ▪ Do I continue to assess the quality of patient care and emerging knowledge relevant to the practice change.                   | <input type="checkbox"/> | <input type="checkbox"/> |

Table 8: Self Assessment checklist

[READ MORE](#). Sackett, D.L. et al., *Evidence-Based Medicine: How to Practice and Teach EBM* (Edinburgh: Churchill Livingstone, 2000).

<sup>22</sup> Adapted from Sackett, D.L. et al., *Evidence-Based Medicine: How to Practice and Teach EBM* (Edinburgh: Churchill Livingstone, 2000), 219-232.

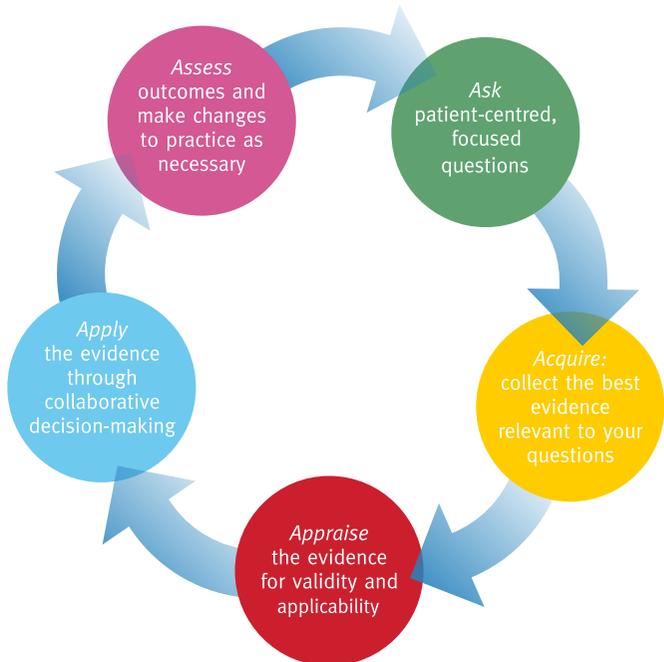
# CONCLUSION

*“A journey of a thousand miles begins with a single step.”*

Lao Tse, ancient Chinese philosopher (604BC - 531BC)

The diagram below – an illustration of the five completed steps in the EBP cycle – is only that: a diagram. On its own, it doesn't accomplish anything and this *Practice Manual* will not accomplish anything unless you put it into practice. EBP needs to be implemented and the systematic approach described here will help you to identify evidence/practice gaps and implement changes in your clinical setting that result in improved patient outcomes. Look around your clinical setting. Have a word with colleagues. Give them a copy of this *Practice Manual*. Is there a specific area of your clinical practice that could be improved? Could you assemble an EBP team?

Take the first step.



# REFERENCES

Centre for Clinical Effectiveness, Southern Health, Melbourne, Australia. *Evidence-Based Answers to Clinical Questions for Busy Clinicians*. Melbourne: Centre for Clinical Effectiveness, 2009.

Centre for Evidence-Based Medicine, Oxford University. Centre for Evidence-Based Medicine website. <http://www.cebm.net/>. Accessed 04 December 2013.

Dawes, M. et al. "Sicily Statement on Evidence-Based Practice," *BMC Medical Education*, 5 (1), 2005.

Duke University Medical Centre Library, Duke University, and the Health Sciences Library, University of North Carolina at Chapel Hill. "Introduction to Evidence-Based Practice." <http://guides.mclibrary.duke.edu/ebmtutorial>. Accessed 04 December 2013.

Evidence-Based Behavioral Practice, "Steps for Evidence-Based Behavioral Practice," <http://www.ebbp.org/steps.html>. Accessed 18 March 2014.

Glazziou, P., Del Mar, C. and Salisbury, J. *Evidence Based Practice Workbook*. 2<sup>nd</sup> edition. Oxford: Blackwell Publishing, 2007.

Hoffmann, T., Bennett, S. and Del Mar, C. *Evidence-Based Practice across the Health Professions*. 2<sup>nd</sup> edition. Edinburgh: Churchill Livingstone Elsevier, 2013.

Muir Gray, J.A. *Evidence-Based Healthcare and Public Health*. Edinburgh: Churchill Livingstone, 2009.

National Network of Libraries of Medicine. National Network of Libraries of Medicine website. <http://nnlm.gov/>. Accessed 04 December 2013.

Panucci, C. and Wilkins, E. "Identifying and Avoiding Bias in Research." *Plastic and Reconstructive Surgery*, 126(2), 2010.

Rengerink, K.O. et al. "Tools to Assess Evidence-Based Practice Behaviour among Healthcare Professionals." *Evidence-Based Medicine*, 18(4), 2013.

Sackett, D.L. et al. *Evidence-Based Medicine: How to Practice and Teach EBM*. Edinburgh: Churchill Livingstone, 2000.

Schub, E. "Evidence-Based Nursing Practice: Implementing." *CINAHL Nursing Guides*. Glendale, CA: CINAHL Information Systems, 2012.

Tilson, J.K., Kaplan, S.L. and Harris, J.L. "Sicily Statement on Classification and Development of Evidence-Based Practice Learning and Assessment Tools." *BMC Medical Education*, 11 (10), 2011.

University of Washington Health Sciences Libraries, "Evidence-Based Practice Tools," <http://libguides.hsl.washington.edu/ebptools>. Accessed 24 March 2014.

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