

Of studies, summaries, synopses, and systems: the “4S” evolution of services for finding current best evidence

Practical resources to support evidence-based healthcare decisions are rapidly evolving. New and better services are being created through the combined forces of increasing numbers of clinically important studies, increasingly robust evidence synthesis and synopsis services, and better information technology and systems. The need for these resources is being spurred by demands for higher quality at lower cost from health services, but the impact of better information resources is being blunted by noisy pretenders, promising “the earth” but yielding just the dirt. Providers and consumers of evidence-based health care can help themselves to best current evidence by recognising and using the most “evolved” information services for the topic areas of concern to them.

Figure 1 depicts a “4S” hierarchical structure, with original Studies at the base, Syntheses (systematic reviews) of evidence just above the base, then Synopses of studies and syntheses next up, and the most evolved evidence-based information “Systems” at the top. Information seekers should begin looking at the highest level resource available for the problem that prompted their search.

Systems

A perfect evidence-based clinical information system would integrate and concisely summarise all relevant and important research evidence about a clinical problem, and would automatically link, through an electronic medical record, a specific patient's circumstances to the relevant information. The user would then consult the system—in fact, be reminded by the system—whenever the patient's medical record was reviewed. The information contained in the system would be based on an explicit review process for finding and evaluating evidence, and would be reliably updated whenever important new research evidence becomes available, so that the clinician and patient could always have the benefit of the current best evidence.

The system would not tell the decision maker what to do—these clinical judgments would need to integrate the system's evidence with the patient's circumstances and wishes.¹ Rather, the system would ensure that whatever cumulative

research evidence had to say about the patient's problem was immediately at hand. Furthermore, a short synopsis would be at the point of first interaction with the user to maximise speed of use, but this synopsis would be electronically linked to the syntheses, then original studies, on which it was based so that the user could go to whatever depth was needed to verify the accuracy, currency, and details of the synopsis.

Readily available systems don't reach this level of perfection, but production models exist for parts of such systems. Electronic medical record systems with computerised decision support rules have been shown in randomised trials to improve the process, and sometimes the outcome,² of care, but these cover a limited range of clinical problems, are not necessarily based on current best evidence, and are mainly “homebuilt,” thus not easily acquired in most practice settings.

Given that we have some way to go before current best evidence is integrated into electronic medical records, some excellent, but less developed systems are now available. For example, some electronic textbooks integrate evidence-based information about specific clinical problems and provide regular updating. UpToDate (on CD and the internet: <http://www.uptodate.com>) for general internal medicine is one of the leading examples of an evidence-based textbook at present, but it is not explicit about the processes it uses to ensure that all relevant evidence is reviewed, assessed, and included, and it isn't integrated into electronic medical records.

Clinical Evidence (<http://www.evidence.org>) is a new contender. It has an explicit review process, and integrates evidence about prevention and treatment for a broad and rapidly expanding array of clinical problems in all medical disciplines, including several chapters on mental health disorders. Thus, it provides a model for the 4S approach to building information systems that are firmly based on underpinning studies, syntheses, and synopses. *Clinical Evidence* is also available on Ovid (<http://www.ovid.com>) as a separate book title, with integration into Ovid's Evidence-Based Medicine Reviews (EBMR) service promised for 2001.

Although none of these systems is integrated with electronic medical records, they can be run through the same computers that run electronic medical records, so that one need not go to a remote location to find them. Unfortunately, connecting the right information to a specific patient's problems requires that clinicians understand evidence-based care principles, and that they apply some effort and skill in using the resources. Fortunately, these emerging information systems reduce these burdens considerably.

Synopses

When no evidence-based information system exists for a clinical problem, then synopses of reviews or individual studies are the next best source. What busy practitioner has time to use evidence-based resources if the evidence is presented in its

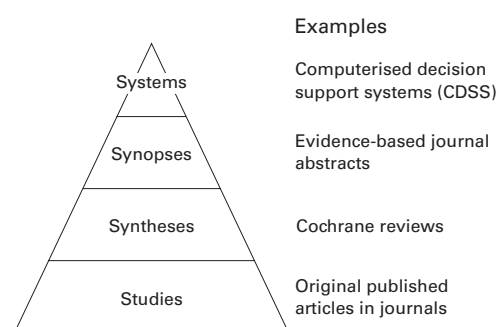


Figure 1 “4S” levels of organisation of evidence from research.

original form or even as detailed systematic reviews? While these detailed articles and reviews are essential building blocks, they are often indigestible if consumed in whole on the run. The perfect synopsis would provide exactly enough information to support a clinical action, obviating the need to read the whole article or review. The most digestible attempt to do this would be the “one liner” declarative titles for the abstracts that appear in *Evidence-Based Mental Health (EBMH)*, such as “virtual reality exposure was as effective as standard exposure for reducing fear of flying” in this issue of *EBMH*. A more detailed summary from one of *EBMH*’s sister publications, including the declarative title plus the essential details on which this is based, appears in the table. In some circumstances, either of these can provide enough information to allow the decision maker to proceed, assuming familiarity with the nature of the intervention and its alternatives. If not, the synopsis should be backed up by more detail, immediately at hand. The full abstract for this item is in *Evidence-Based Medicine* and *Best Evidence*, with an abstract and commentary on 1 full printed page. The synopsis in the table could be easily adopted to wireless palmtop internet devices.

Syntheses

If more detail is needed, or no synopsis is at hand, then databases of systematic reviews (“syntheses”) are available, notably the *Cochrane Library*, which is available on CD, internet (<http://www.updateusa.com/clibip/clib.htm>), and in Aries Knowledge Finder (KF) (<http://www.kfinder.com>) and Ovid’s EBM service. These summaries are based on a rigorous search for evidence, explicit scientific review of the studies uncovered in the search, and systematic assembly of the evidence to provide as clear a signal about the effects of a healthcare intervention as the evidence will allow. Unfortunately, these reviews do not yet extend to clinical topics other than preventive or therapeutic interventions.

Stimulated by the success of the Cochrane Collaboration, the number of systematic reviews in the medical literature has grown tremendously in the past few years; if the *Cochrane Library* doesn’t have a review on the topic you are interested in, it is worthwhile looking in Medline. Better still, Ovid EBM and Aries KF provide one stop shopping for both Cochrane and non-Cochrane systematic reviews. For the example of “clozapine and schizophrenia,” a search on Ovid’s *Best Evidence*, Cochrane, DARE, and Medline databases retrieves 736 items. Limiting this search to “EBM Reviews” (a check box below the search window in Ovid) cuts this down to 19 items, all but 2 of which are individual randomised controlled trials that are linked to Cochrane Reviews in which they are summarised. Cochrane Reviews are also now indexed in Medline: “clozapine and Cochrane Review” in PubMed retrieves 6 Cochrane reviews in which clozapine is considered.

Studies

If all the other Ss fails (ie, no system, synopses, or syntheses), that’s the time to look for original studies. On the web these can be retrieved in a number of ways. Especially if you don’t know which database is best suited to your question, search engines that are tuned for healthcare content can assemble access across a number of web based services. At least one of these search engines is attentive to issues of quality of evidence, namely, SUMSearch (<http://sumsearch.uthscsa.edu>). Nevertheless, the user must appraise the items identified by such a search to determine which fall within the “quality rated” schema presented here—many will not, especially when convenience of access is favoured over quality. There are also at least 2 levels of evidence-based databases to search directly, specialised and general. If the topic falls within internal medicine and primary care, then *Best Evidence* provides a specialised, evidence-based service, because the articles abstracted in this database have been appraised for scientific merit and clinical relevance. If the search is for a treatment, then the *Cochrane Library* includes the Cochrane Controlled Trials Register. SilverPlatter and other bibliographic database companies have specialised versions of Medline. Medline itself is freely available (<http://www.ncbi.nlm.nih.gov/PubMed/>), and the clinical queries screen provides detailed search strategies that home in on clinical content for diagnosis, prognosis, treatment, and aetiology.

If none of these services provides a satisfying result, it is time to go to the main search screen in Medline’s PubMed and try there. If you still have no luck, and the topic is, say, a new treatment (one that your patients have asked about but you don’t yet know about), then try Google (<http://www.google.com>). It is incredibly fast and can get you to a product monograph in a few milliseconds. At least you will find what the manufacturer of the treatment claims it can do, as well as detailed information on adverse effects, contraindications, and prescribing. The Google home page allows you to add a Google search window to your web browser’s home page. Unless you are a very slow typist, this is the fastest way to get to almost any service on the internet, including all the ones named in this article that are web accessible.

It’s worth emphasising that almost all the resources just reviewed are available on the internet. The “value added” of accessing these services on the web is considerable, including links to full text journal articles, patient information, and complementary texts.

Is it time to change how you seek best evidence?

Compare the ‘4S’ approach with how you usually seek evidence-based information. Is it time to revise your tactics? If, for example, it surprises you that Medline is so low on the 4S list of resources for finding current best evidence, then this

*A prototype for evidence synopsis for hand-held computers**

Based on: Review: clozapine reduces relapse and symptoms compared with typical neuroleptic drugs in schizophrenia. *Evidence-Based Medicine* 1997 Nov-Dec;2:182. Abstract of: Essali MA, Rezk E, Wahlbeck K, et al. Clozapine v typical neuroleptic medication for schizophrenia. *Cochrane Database Syst Rev* 1997;(2): latest version 4 March 1997.

Question	Study groups	Outcome	Weighted EER	Weighted CER	RRR (95% CI)	NNT (CI)
In patients with schizophrenia, what is the effectiveness of clozapine compared with typical neuroleptic drugs?	Experimental: clozapine Control: typical neuroleptic drugs	Relapse (n=18 studies)	10.8%	13.5%	41% (19 to 57)	37 (19 to 588)
		Outcome	Weighted EER	Weighted CER	RBI (CI)	NNT (CI)
		Clinical improvement (n=14 studies)	53.3%	34.1%	50% (33 to 69)	6 (5 to 7)

Conclusion: Clozapine reduces relapse and symptoms and produces clinically meaningful improvement in patients with schizophrenia.

*Abbreviations: EER=experimental event rate; CER=control event rate; RRR=relative risk reduction; RBI=relative benefit increase; NNT=number of patients needed to be treated to prevent 1 additional bad outcome or to create 1 additional improved outcome.

communication will have served a purpose: resources for finding evidence have evolved in the past few years, and searches can be a lot quicker and more satisfying for answering clinical questions if the features of your quest match those of one of the evolved services. This is in no way a knock against Medline, which continues to serve as a premier access route to the studies and reviews that form the foundation for all the other more specialised databases reviewed above. There are big rewards from becoming familiar with these new resources and using them whenever the right clinical question presents itself.

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- 1 Haynes RB, Sackett DL, Gray JRM, *et al*. Transferring evidence from research into practice: 1. The role of clinical care research evidence in clinical decisions [editorial]. *ACP J Club* 1996;**125**:A14–6; *Evidence-Based Medicine* 1996;**1**:196–8.
- 2 Hunt DL, Haynes RB, Hanna SE, *et al*. Effects of computer-based clinical decision support systems on physician performance and patient outcomes: a systematic review. *JAMA* 1998;**280**:1339–46.

Conflict of interest statement: Brian Haynes has direct or indirect connections with many of the evidence-based resources used as examples above, including *ACP Journal Club* (editor), *Evidence-Based Medicine* (co-editor), *Best Evidence* (editor), the *Cochrane Library* (reviewer, and former board member and Cochrane Centre director), *Scientific American Medicine* (associate editor), *Clinical Evidence* (advisory board), and PubMed Clinical Queries (developer). These resources are used to illustrate the concepts in the article; there are other, and perhaps better, examples.

Evidence-based psychiatric/mental health nursing

Psychiatric/mental health nursing is often like a house divided. Even the double name commonly used to describe our specialty—psychiatric/mental health—reflects possible ambivalence or duality of purpose, or both. It should not surprise anyone that our attempts to implement evidence-based practice mirror this struggle.

Mental health nurses initially defined our practice as an interpersonal therapeutic process to assist the client in growth.^{1–3} This was in synchrony with psychiatry's earlier focus on psychotherapy as the treatment for mental illness. The division in mental health nursing occurred when psychiatry moved to a more biological perspective. Should mental health nursing follow this route or continue to focus on counselling and process issues? Both the "therapeutic relationship" and "biology" camps have used evidence-based arguments to buttress their positions. It could be argued that all the psychiatric/mental health professions experience this struggle, but it has been a particularly open struggle in nursing.

The struggle is present in our literature. Gournay's article, "Schizophrenia: a review of the contemporary literature and implications for mental health nursing theory, practice and education," is an example of this struggle.⁴ The main purpose of this article was to review the literature on schizophrenia from a biological perspective, including the aetiology, epidemiology, and neuropsychology of schizophrenia. A good chunk of the paper, however, focused on berating nurses for using interpersonal nursing theory. This paper was a continuation of an earlier article criticising the use of nursing theory in mental health nursing.⁵ Similarly, McCrone also wrote of the effect of biological psychiatry on nursing and noted "In the future, psychiatric nurses will need to know normal neuroanatomy, physiology, psychoneuroendocrinology, and immunology to understand deviations occurring with mental disorders" (p 46).⁶ These resulted in various volleys between the camps. For example, Dawson reviewed the articles included in Gournay's review and concluded that the evidence for a biological understanding was overstated by Gournay.⁷ Barker and Reynolds criticised Gournay's understanding of models and theories.⁸ In reply to the concern that Peplau's interpersonal theory did not include, for example, a biological basis for hallucinations, it was pointed

out that none of the biological theories pays any attention to Peplau's theory of interpersonal relations.

Poor psychiatric/mental health nurses reading through this may be scratching their heads wondering what the evidence is for any of the discussion.

An attempt to move beyond the nursing literature yields similar controversy and uncertain conclusions. The classic meta-analysis of psychotherapy outcomes from Smith and Glass found only a modest effect size.⁹ Cooper & Hedges, however, compared this modest effect size of $r=0.32$ that sounded the death knell of psychotherapy with such effect sizes as those for 3'-azido-3'-deoxythymidine in patients with AIDS ($r=0.23$), where the effect was considered so strong that the clinical trial was closed prematurely.¹⁰ Huxley and others reviewed 32 peer reviewed articles relating to the effectiveness of psychosocial treatments in bipolar disorder.¹¹ They concluded that although the studies were few and of variable quality, important gains were found such as increased clinical stability, fewer hospital readmissions, and improved function.

More recently, Klein re-examined 4 meta-analyses comparing psychotherapy with pharmacology.¹² The original meta-analyses all found favourable results for psychotherapy, but Klein found numerous flaws in the studies used in the meta-analyses. Most disturbing was that few of the studies actually included a direct comparison of psychotherapy and pharmacology at all. Klein concludes "...the currently available data simply do not allow for a proper meta-analysis that can address the relative merits of pharmacology and psychotherapy" (p1210).

Surely one could argue that these articles in the psychiatry literature show that a similar struggle exists between biological and psychotherapeutic approaches in the mental health literature generally. The difference with nursing is that the struggle goes beyond the evaluation of whether the biological or interpersonal approach makes more sense based on the evidence. It is also based on the more philosophical question: should nursing follow medicine or position itself in an alternative/complementary position? Nursing, like other professions, endeavours to implement strategies that are known to be effective. In addition to being effective interventions, however, do they not also need to be *nursing* interventions? For example, even if psychopharmacology offered great benefit,

does that mean that this should become the focus of psychiatric/mental health nursing as well as psychiatric medicine? If the evidence does not exist for a nursing intervention, does this reflect an ineffective intervention, or an understudied intervention?

When the psychiatrists, social workers, psychologists, nurses, and others use the best evidence-based practice available, the client should receive the best possible care. The focus of each profession, however, will be unique but complementary to address the range of issues faced by the client. For nursing, this focus has traditionally been the development of therapeutic relationships to foster growth. This focus would not change because a biological understanding is useful, but could change based on whether a therapeutic relationship continues to be a need of clients. What is needed to evolve our focus is continued study and examination of the evidence related to our current psychiatric/mental health nursing practice: therapeutic relationships.

The current Therapeutic Relationships: From Hospital to Community study is an example of research that examines a nursing intervention.¹³ The study involves a randomised cluster design with 26 psychiatric wards and 350 clients. The intervention focuses on the development of a safety net of interpersonal relationships. This nursing intervention is complementary to, but different from, the psychiatric treatment that is received. This study is one of a small but growing number of efforts to scientifically evaluate nursing interventions.

The arguments using the evidence to define an appropriate focus for psychiatric/mental health nursing seem reminiscent of the famous quote of the Scottish writer and poet, Andrew Lang (1844–1912): “... he uses statistics as a drunken man uses lampposts: for support rather than illumination.” To move towards illumination we need to ask questions arising from our

practice. To develop evidence-based psychiatric/mental health nursing practice, we need to evaluate psychiatric/mental health nursing strategies. The results of well designed research will provide the light to guide our way to providing the best possible services for our clients.

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New associate editor

This issue, we are delighted to welcome Dr Fergus Law who joins *Evidence-Based Mental Health* as Associate Editor. Dr Law is currently a lecturer at the psychopharmacology unit at the University of Bristol, UK and brings valuable clinical and research experience in the field of substance abuse.