1. Introduction

Adopting an evidence-based approach to clinical practice was prompted by, among other things, two main observations. Firstly, the gaps between our clinical decisions and the validity of the evidence we use in support of these decisions. It is not an exaggeration to state that most clinical decisions are based on what we think is the evidence, not what we know is the evidence. We may use brief reading and talking to other people as our source of information, since no one has time to appraise all of the evidence. Our clinical decision-making is influenced by at least three factors such as patient’s request, pharmaceutical representatives’ recommendations or local “expert” led continuous medical education activities. I suppose that these are not the best sources of information (1).

Secondly, the overwhelming volume of published research, as reported by Glasziou in 2005, each year, MEDLINE indexes over 560,000 new articles and Cochrane Central adds about 20,000 new randomized trials. This is about 1500 new articles and 55 new trials per day! (2). In 2009, the numbers were 1950 articles per day and 95 trials per day (3).

How much of this massive health information is VALID and RELEVANT? The editorial process of the “evidence-based medicine” journal provides an answer and an insight into the issue of validity and relevance. About 120 general medical journals are scanned by the editorial team resulting in about 60,000 articles per year. After critical appraisal of each of these articles, less than 5% are found to be valid. Valid articles are sent to 6–12 general practitioners and specialists to assess relevance and newsworthiness on a 7 point scale. Only less than 0.5% of the articles are judged to be valid and relevant to be published in “evidence-based medicine” journal as evidence synopsis (4).

Clinicians are very busy to set time aside to read and keep up to date with the overwhelming research publications, let alone to sort out the valid and relevant from that is otherwise. It is well recognized that there is a gap between clinical decisions and the strength of evidence in support of such decisions. Hence, the call to all health care providers to make the paradigm shift into evidence-based health care or evidence-based medicine (EBM). Clinicians who want to embrace evidence-based practice need not be expert in critical appraisal (validity check) yet can be efficient users of evidence as described by Attia (5).

Keeping up to date with valid and relevant evidence to support our clinical decisions requires a practical approach to accessing and using quality information to improve the care of our patients. We need to be information masters. To this end we need to reconsider our information seeking behavior. Traditional medical training, especially in our part of the World, emphasizes volume of information that we can store...
in our brains rather than emphasizing how to efficiently use information to solve problems. The concept of information mastery was developed in the early 90s (6). As the originator of the concept of information mastery puts it “Clinicians will be valued by how they think and not by what/how much they know” (6). In this day and age of information technology, knowing how to use computers and accessing information is a prerequisite to be an information master.

The overall concept of information mastery revolves around a triangular relationship between validity, relevance and amount of work exerted to get the information. The usefulness of any source of information varies with how relevant and how valid it is, and how much work it takes to find that information. The challenge is to balance the elements of the triangle and get relevant and valid information with the least amount of work (9).

2. Relevance

Relevance has to do with what information is important and needs our attention. In considering relevance we need to differentiate between two types of outcomes that any evidence support. Outcomes that are important to the patient, known as patient oriented outcomes. These deal with mortality, morbidity and quality of life issues. The other type of outcomes are known as disease oriented outcomes. These deal with pathophysiology, pharmacology and etiology of a disease. To demonstrate this concept I will use the case of menopausal hormone replacement therapy (HRT) and cardiovascular disease. There is large body of evidence showing that HRT does improve lipid profile. This is an example of disease oriented evidence. Is this important to patients? The large “Women Health Initiative” randomized trials failed to demonstrate any reduction in cardiovascular events. This is an example of patient oriented evidence. It is not important to patients whether HRT improve their lipid profile as long as it does not reduce morbidity or mortality.

3. Validity

Critical appraisal of the literature (the third step in practicing EBM) is the process that determines whether the evidence is valid or not. It is the most difficult step in the practice of EBM. Critical appraisal skills can be mastered by most clinicians but, most do not have the time or the interest to acquire an acceptable skill level in this regard. It makes a lot of sense for a busy clinician to rely on some body else to evaluate the validity of new information or evidence provided that this some body is trustworthy. We can no longer trust something because it is “in a book” or spoken/written by someone with a lot of initials after their name coming from a well-known institution.

4. Work

Is the amount of effort exerted to obtain the information such as searching the internet, going to the library or going through a pile of journals in the office or home!

It has been reported that the source clinicians turn to the most when they have a question is a colleague (7,8). It stand to reason that this approach takes the least amount of time/work to obtain an answer, since the colleague is nearby. However, if the answer is not both relevant and valid, the information is likely to be useless. On The other hand if the most relevant and valid information is available in the library and it takes 20 min to do a Medline search (or flip through the library catalog) and another 20 min to critically appraise the information, the work is so high that most busy clinicians

<p>| Table 1 Examples of high quality clinical awareness systems. |
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<table>
<thead>
<tr>
<th>No.</th>
<th>Resource</th>
<th>Description</th>
<th>Cost</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cochrane database</td>
<td>Systematic reviews of effects of interventions for prevention, treatment, rehabilitation and accuracy of a diagnostic test</td>
<td>Summaries: free</td>
<td><a href="http://www.cochrane.org/cochrane-reviews">http://www.cochrane.org/cochrane-reviews</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Full reviews: subscription</td>
<td></td>
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<tr>
<td>2</td>
<td>Essential evidence plus</td>
<td>Evidence-based point-of-care information and summaries</td>
<td>Requires subscription</td>
<td><a href="http://www.essential">http://www.essential</a> Evidence plus.com/</td>
</tr>
<tr>
<td>3</td>
<td>Dynamed</td>
<td>Monitors the content of over 500 medical journals and systematic review databases</td>
<td>Requires subscription</td>
<td><a href="http://www.ebscohost.com/dynamed/default.php">http://www.ebscohost.com/dynamed/default.php</a></td>
</tr>
<tr>
<td>4</td>
<td>Clinical evidence</td>
<td>Covers common clinical conditions seen in primary and hospital care</td>
<td>Requires subscription</td>
<td><a href="http://clinical">http://clinical</a> evidence.bmj.com/cweb/index.jsp</td>
</tr>
<tr>
<td>5</td>
<td>BMJ update</td>
<td>A joint collaboration between BMJ group and McMaster University to provide access to current best evidence from research</td>
<td>Free</td>
<td><a href="http://plus.mcmaster.ca/EvidenceUpdates/">http://plus.mcmaster.ca/EvidenceUpdates/</a></td>
</tr>
<tr>
<td>6</td>
<td>Up-to-date</td>
<td>UpToDate covers over 8300 topics in 16 medical specialties</td>
<td>Requires subscription</td>
<td><a href="http://www.uptodate.com/home/index.html">http://www.uptodate.com/home/index.html</a></td>
</tr>
<tr>
<td>7</td>
<td>AHRQ clinical practice guidelines</td>
<td>Recommendations for clinical preventive services via the US Agency for Health Research and Quality website</td>
<td>Free</td>
<td><a href="http://epss.ahrq.gov/PDA/index.jsp">http://epss.ahrq.gov/PDA/index.jsp</a></td>
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are not willing to exert and simply will not seek the information.

In order to survive in the information age, clinicians will need:

1. A tool or a system that will enable them to find relevant and valid information when they need it. This is called “just in time information”.
2. A tool or a system that will provide them with valid and relevant new information in their discipline as it becomes available and assembles the valid and relevant information in an easy to understand form. This is called “just in case information”.

The idea is that clinicians should be aware of new valid and relevant information and easily retrieve it when needed. Good quality systems/tools that provide both just in case and just in time information are available (also known as clinical awareness systems). Some of these systems are free while others require a subscription. On the other hand there are large numbers of so called alert systems, most of which are free and delivers the alerts or summaries via email, that do not filter the alerts for validity and relevance. Most of these are free marketing outlets for health care industries.

Characteristics of an ideal clinical awareness system:

1. Specialty-specific. Allow the user to specify what to receive.
2. Comprehensive in its coverage of the specialty literature.
3. Coordinated just in case (regular emails) and just in time tools (easily searchable).
4. Specific criteria for relevance and validity are explicitly explained.
5. Available at the point-of-care, computers or handheld devices.
6. All backed up by levels of evidence and or grade of recommendations.

Examples of high quality systems are shown in Table 1.

References

(2) Glasziou P. The path from research to improved health outcomes. ACP Journal Club 2005;142:8–10.
(3) <http://www.nlm.nih.gov/bsd/index_stats_comp.html> [accessed 29.06.10].
(4) <http://ebm.bmj.com/site/about/whyread.xhtml>; [accessed 13.03.10].