

## Information-Seeking behavior of clinicians in EBM process<sup>1</sup>

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### Abstract:

*E*vidence-based medicine (EBM) is a new paradigm and defined as the consciousness, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The EBM process is systematic starting with the identification of the patients' problem or well built clinical questions which lead to search the best critical, appraisal evidence and adaptation to each patient. Since EBM process has a direct impact on clinicians in seeking information, they should keep up to date to retrieve the new and best evidence for patient care decision. In addition, the clinicians should have skill in technology and be enthusiastic to search for the best information and concentrate to choose the appropriate resources including use the strategy of searching the information. The clinicians in EBM process face great barriers such as lack of time, inadequate searching skills and their lack of confidence in using technology. Many studies have shown that the stakeholders realized the great barriers and encourage clinicians for information seeking.

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**Keywords:** 'evidence-based medicine' 'information seeking and physician' 'information need and physician' 'EBM information seeking'

## 1. EBM and concept

Evidence - based medicine (EBM) is a new paradigm and defined as the consciousness, explicit and judicious use of current best evidence in making decisions about the care of individual patients. EBM has been introduced since 1990 by Evidence-Based Medicine Working Group, Department of Epidemiology and Biostatistics McMaster University of Canada (Guyatt & Rennie, 2002). They should comment that the information has exploded daily and the medical researches proceed so far. But the traditional patient-care decision is not systematic. It relies on clinician's experience, basic knowledge and textbooks including the consultation of clinical expert ; these are not enough for patient care at present. The EBM group

proposed that clinician's experience be restricted because patients' symptoms were so different (Eldredge, 2000). The pathophysiology and basic knowledge from textbooks are useful but they are not suitable for all patients. The clinical practice should be integrated between the clinical experience, up to date, critical evidence and patients' preferences, and values including economic and other proper variables. Therefore, the EBM group proposed EBM as the new paradigm shift with the concept as follow: the only one evidence was not enough for clinical decision making but realizing the patient's profit, risk, inconvenient and economy including the consent, believable from patient himself and family. (Sackett et al., 2000)

## 2. The practice of EBM process

The practice of EBM process comprises 5 important steps, and their details are as follow: (Bigby, 2000 ; Sackett et al., 2000 ; Guyatt & Rennie, 2002 ; Pwee, 2004)

### Step 1: Well-built clinical question

Clinician poses the clinical question for each patient's symptom. The details of the clinical question should be well built to find out the best and suitable evidence for patient decision making. The clinical question is the first step to search from the best evidence so as to make clinician careful to build the clinical question. There are 2 kinds of clinical questions.

- 1) Background question: The question in general practice such as: what is hypertension? What is the degree or severity of hypertension?
- 2) Foreground question: The question specific on each patient's symptom comprises 4 parts: the patient himself or population, the intervention, the comparable intervention and the outcome.

### **Step 2 Clinical evidence**

Clinician tries to find out the clinical evidence to answer the clinical question as much as possible and the best evidence should be the information for answering the clinical question. After analyzing and synthesizing the literatures emerged 3 kinds of the clinical evidence such as 1) patient history, 2) clinical background and 3) clinical research.

### **Step 3 Critical appraisal evidence.**

The best clinical research should be appraised. Clinician appraises clinical research from methodology and the international standard of each medical care as follow: diagnosis, therapy, prognosis, and risk/harm, etc.

### **Step 4 Apply the evidence to specific patient.**

For clinical practice, the appropriate clinical importance of the evidence should be applied to each patient. In step 4 clinician uses his own experience and knowledge of the practicing patient including the respect and wishes of patient's value.

### **Step 5 Assess the outcome**

Outcomes of the clinical practice for the patient should be assessed while realizing the patient's satisfaction. Clinician should review that the former steps are precise and help the patient. The improvement might be set for the next time if the outcome is not satisfied.

The EBM process should be systematic including the identification of the patients' problem or well built questions which lead to search the best critical and appraisal evidence as applied to each patient by realizing the patient preferences, values and assessing the outcomes. In EBM process, clinicians in daily practice use the best available evidence and patient preference for patient-care decisions making. EBM process has improved the medical care, lessened clinical malpractice, protect the patient rights and assigned to medical curriculum. (Rosoff 2001 ; Finkel et al., 2003 ; McDonagh and Hurwitz 2003 ; Albert and Easton, 2004 ; Coleman et al., 2004 ; Dorsch et al., 2004 ; Lewis and Orland, 2004 ; Lucas et al., 2004). EBM is now widely accepted for clinical practice worldwide, especially in The United States and several other countries in Europe.

## **3. Behavior of information seeking**

The EBM process impacts the clinicians in practicing EBM. Clinicians should have the competency in searching the relevant information, appraising the evidence and integrating

with value and preference of patient's decision, finally adapt to clinical practice. As the concept of EBM emphasizes clinical research evidence, the quality of the clinical evidence is

based on the research methodology and the explicit international standard. EBM clinicians should develop a willingness to seek out and choose high quality appraised evidence and secondary sources of evidence from amongst what are available. The clinical evidence should be reliable, valid, up to date, fast and useful because the patients' life are the most important. The best evidence derived from critical appraisal of the literature, evidence-based abstraction services, online and other forms of electronic literature searching. Systematic review is the best clinical research which is the critical evidence synthesizing and integrating the results of multiple original primary investigations by using strategies that limit bias and random error. Today systematic reviews are growing numerously, Therefore, the clinicians should try to find out the high quality evidence for many of the

clinical decisions (Murlow, Cook, & Davidoff, 1997).

Behavior of information seeking in EBM differs from the others because of the role of the clinician. In EBM process, clinicians use the integration of experience, critical evidence and patient's value. Patient's life is the most important, so the accurate decision making in patient care should be concerned. Information to support the patient care decision making is very crucial. This impact on the clinicians using EBM requires them to have skill in information and technology. They should be enthusiastic to continue their professional development and life-long learning. By the way, clinicians should concentrate to choose the appropriate resources and use the strategy to search concluding the result of searching by critical appraising and decision making in selecting the best evidence for patient care.

#### 4. Types of clinical information and resources

The outcome of the study of information seeking behavior and information needs implementation to the management of useful and suitable information for the respondents. There are numerous studies of information seeking behavior and information need of clinicians in EBM process. The outcomes of the studies indicate 2 major objective information seeking types: 1) answering the clinical question and 2) receiving the new clinical information. (Bryant, 2000 ; Green, 2000 ; Hess, 2003 ; Bennett et al., 2005)

Clinicians mostly use many kinds of information as they need. In EBM process, the information is very

important which could be emerged in 4 kinds as follow:

##### 1) **Patient information:**

patients' history of physical examination including clinical data, laboratory report, MRI report, from patient/family interviewed, medical record, demographic, etc.

##### 2) **Background information:**

background information to answer the clinical question from textbooks and journals available in information service institute and online databases.

##### 3) **Experience/Expert:**

information: clinical tacit knowledge from expert in medical specialty as teachers, colleagues and expertise. This type of information resource is

preferred for clinician uses. The studies show that this resource is easy to access for face-to-face contact, so the rate of uses are still constant.

#### 4) **New clinical innovation:**

In EBM process, systematic review (SR) is defined as the best evidence from online databases such as PubMed, Cochrane Library, Ovid, Embase, UpToDate and ACP Journal club, etc. These databases are available in medical library service. Usually medical library concerns the usefulness of the EBM databases and realizes to manipulate the information management to include information service. SR is the best clinical research which is the critical evidence synthesizing and integrating the results of multiple original primary investigations by using strategies that limit bias and random error (Cook, Mulrow, & Haynes, 1997). SR is generated to answer specific, often narrow, clinical question in depth. The clinical question can be emerged from 4 steps: the population or patient

problem, the ways of intervention, the comparable methods and the needed outcome. The synthesized studies have indicated that SR is very useful for EBM process.

The various kinds of information resources are available such as the structured abstracts, updated high quality textbooks in online version, the structured excellent review Cochrane Library that disseminates high quality SR of randomized controlled trials (RCT) including sources of primary literature: Medline (NLM), Medline Ovid, EMBASE, full-text online journals (via WWW) with free accessibility and subscription.

The best way to retrieve the best information for clinician is very helpful for decision making in patient care. The information from one stop service and on time retrieving strategy are acquired to support the clinicians. The numerous clinical information scatter, worldwide but the quite suitable information should be described.

### 5. Characteristics of clinical information seeking

The characteristics of clinical information differ from other subjects. Guyatt & Rennie (2002) proposed the 3 basic criteria of clinical evidence 1) Validity, 2) Usefulness and 3) Relevance. These characteristics show that clinical information is quite important. The best evidence should be selected and filtered as soon as possible. Today is the information age, Hence the information scatters worldwide and the clinicians face the barrier for retrieving the critical evidence. To practice EBM, clinicians should have the competency in

searching the informations, that is valid, useful and relevant. The information should be critical appraising and integrated with value of patient decision, finally adapt to clinical practice. There are many studies showing that the clinicians in EBM process needed the up to date, best, useful, relevant, simple accessible and high quality information (Bennett, Casebeer, Kristofco, & Collins, 2005 ; Haigh, 2006). The special characteristics of clinical information for clinical decision making are shown in Table 1.

**Table1: Characteristics of clinical information**

Up-to-date
Best-evidence
Relevant
Simple and accessible
Useful
Fast
Valid

The information is useful for patient care because patient's life is very important. Clinicians have an ethical responsibility to ensure the accuracy of the information given to patients, whether it be in verbal, print, or electronic form.

## 6. Obstacles of clinical information seeking

The clinical questions arise in daily practice. There are 2 kinds of questions such as the conscious or manifest and unconscious or latent questions that were analyzed. The conscious or manifest questions could be answered but unconscious or latent questions could not so the leave-out of the answer happens. Most practitioners use information to support patient care several times per week, and patients were being waited (Andrews et al., 2005). The inherent obstacles such as lack of time and no necessity to look for an answer were the most important reasons for leaving the questions answered. (Kapiriri & Bondy, 2005). The resources being relied are due to the simple, easy and convenient accession such as colleagues, and personal experience being increased. The more spread of the clinical knowledge the more difficult to find out the answer to pursue the clinical questions. The studies have shown that family physicians can be overwhelmed by many factors such as the quantity of clinical information, their inadequate searching skills and their lack of confidence that they will be able to

answer the question (Bennett et al., 2005). The EBM process impacts clinicians in seeking information, so they should keep up to date to retrieve the new information for patient care decision. Clinical information seeking is divided into 2 modes that are active mode and passive mode. The active mode is seeking by clinicians themselves and passive information is seeking from other providers such as pharmaceutical representatives or the stakeholders (Schaafsma et al., 2006). Nevertheless, clinicians could not pursue all clinical information due to the constraints. (Andrews et al., 2005). Information overload is considered one of the key barriers to accessing the best evidence for decision making and effective knowledge updating and is being addressed through EBM methods.

The lack of knowledge of resources includes its own interface and architecture so it takes long time to find out the answers from multiple resources that can be major barriers. There are several obstacles (Cohen et al., 2003 ; Sladeks, 2004 ; Andrews et al., 2005 ; Schaafsma et al., 2006) that usually

occurred such as lack of time, the complexity in the use of the resources, the quality and quantity of evidence resources, inadequate provision of infrastructure technology, information

seeking skill/experience/knowledge, attitude in information service and location of clinicians' office.(Table2). These problems are great barrier for clinicians' seeking information.

**Table2: Obstacles of clinical information seeking**

Lack of time
Information overload
Complexity of information searching resources
Ineffective online network
Inadequately infrastructure technology
Inadequate support resources
Information seeking skill/experience/knowledge
Attitude in information service
Location of clinicians' office

The obstacles which are the great barriers remain homogeneous and may be increased if there are no response from clinical stakeholder including the clinician himself. EBM process is the new paradigm that is very beneficial to patients' profit. Clinicians using EBM process should derive the information in convenient ways of information seeking.

## 7. Clinical information management

For the best retrieval clinical information and using critical evidence, the investigation for suitable clinical information management is needed. As many studies have shown that the stakeholders realized the great barriers for clinical information seeking as follow: clinicians have all been encouraged to try and learn how to search databases, find out information, medical professionals (MIPs) upgraded information-seeking skills through mentorship for clinicians (Haigh, 2006) They could decrease the information seeking obstacles as numerous studies showed that the fast, up to date and electronic information support including new roles and competencies of MIPs in manipulate information management

and service are required (Donald et al., 2005 ; Lindberg & Hamphreys, 2005 ; Ludwig & Starr, 2005). Technology offers many promises for enhancing access and use of various knowledge-based sources such as: primary care practice-based research network (PBRN) offer the networks for studying and disseminating including offering a unique "laboratory" for investigating primary care information needs and related problems in real world practices serving a patients in a variety of contexts. Kentucky Ambulatory Network (KAN) has been to develop a practice-based research infrastructure because lacks an integrated informatics infrastructure to support. (Labovitch, Bozic, & Hansen, 2006). The clinician

has spent so long time to find out the answers from multiple sources that can be major barriers. Thus, tools that integrate resource access into a single interface should be further investigated for less time. That is, a more standardized interface would allow access to multiple, disparate resources without having to have special skills to search and synthesize the information from each. Many studies have shown that the models for retrieving the clinical information have been developed to adjust for EBM process (Sim, 1996 ; Tibbs, 1996 ; Seol, 2003 ; Lorence & Spink, 2004) for supporting The clinician information seeking including clinical information management.

The important steps for the practice of EBM include identify the patients' problem, searching and appraising the evidence, clinical application and assessing the outcomes. Clinicians using EBM process should have skill in information technology. They should be enthusiastic to continue their professional development and life-long learning. However, most clinicians are usually busy with their clinical works. The clinicians in EBM process face great barriers such as lack of time, inadequate searching skills and their lack of confidence in using technology.. To facilitate the EBM practice, some assistance should be formed since many studies have shown that the stakeholders such as medical information professionals (MIPs) investigate the information-seeking behavior of clinicians for promoting the library facilities and services to include strategic planning for their end users. They realized the great barriers and encourage clinicians for effective

information seeking due to effective clinical practice.

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