A Primer on Current Evidence-Based Review Systems and Their Implications for Behavioral Medicine

Karina W. Davidson, Ph.D.
College of Physicians & Surgeons
Columbia University

Kimberlee J. Trudeau, M.A.
City University of New York Graduate Center

Judith K. Ockene, Ph.D., M.Ed.
University of Massachusetts Medical School

C. Tracy Orleans, Ph.D.
The Robert Wood Johnson Foundation

Robert M. Kaplan, Ph.D.
University of California, San Diego

ABSTRACT

Background: *Multiple review systems have been established within medicine and psychology to evaluate and disseminate research findings to clinical practice.* ***Purpose:*** *Within this article, five evidence-based review systems are reviewed to inform the development or the use of an evidence review system for the behavioral medicine field.* ***Methods:*** *Each review system is described on several dimensions: history of the review system, the review process, and details about translation/sustainability efforts.* ***Results:*** *Various factors from each system have been identified that would benefit a behavioral medicine evidence review system, such as a discussion of clinical features that influence the generalizability of review findings (i.e., the American Psychiatric Association) and the use of pre-review protocols (i.e., the Cochrane Collaboration).* ***Conclusions:*** *Although each review system has limitations, it is important for behavioral medicine to join one system because (a) systematic reviews are the only feasible means to evaluate and judge the usefulness of our interventions, and (b) reviews can inform policy, and, with effort, influence patient well-being. This group of behavioral medicine experts recommends that the Cochrane Collaboration review behavioral medicine interventions.*

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INTRODUCTION

Evidence-based review systems, such as the Cochrane Collaboration (1), are organized efforts to assist practitioners, patients, and researchers in making well-informed decisions through preparing, maintaining, and promoting access to relevant systematic evidence reviews.

There are a number of established systems and panels for reviewing and synthesizing clinical research for the purpose of identifying the evidence-based practices and guidelines that are the building blocks of evidence-based medicine. However, few of these systems address behavioral medicine interventions and protocols and, from the Evidence-Based Behavioral Medicine Committee's experience,[1] behavioral medicine clinicians and researchers have limited knowledge of them. The purpose of this article is to briefly acquaint behavioral medicine experts with the ways in which other review systems and recommendation bodies operate, the substantive areas that they cover, and their possible limitations. This information is provided to inform the field of behavioral medicine regarding the use and limitations of existing systems and to recommend an existing review system for behavioral medicine to join. We begin by defining evidence-based medicine and the process by which one arrives at an evidence-based intervention recommendation.

"Evidence-based medicine [EBM] is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (2, p. 71). Thus, EBM is a process for systematically reviewing, synthesizing, and applying relevant research to clinical questions to inform clinical practice (3). Introduced as *EBM*, this type of problem-based learning approach was formally inaugurated by physicians at McMaster University in Canada approximately 10 years ago and is now in wide international use (4,5).

The philosophy behind science-based medical practice has, of course, existed for centuries (2). However, the impetus for formally teaching this style of medical practice (6), for launching journals devoted to this movement (2), and for creating Web sites that present evidence-based guidelines for a variety of

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Reprint Address: K. W. Davidson, Ph.D., 622 West 168th Street, PH9 Center, Room 948, Behavioral Cardiovascular Health & Hypertension Program, Columbia University, College of Physicians & Surgeons, New York, NY 10032.

[1]Please see www.sbm.org/ebbm/ for more information on the members and activities of the Evidence-Based Behavioral Medicine Committee.

medical treatments (1) has occurred more recently in response to the explosion of controlled clinical intervention research and related research publications. The ability to conduct computer searches and literature retrievals to form evidence-based recommendations has facilitated systematic evidence reviews, fueling a more wholesale adoption of this framework (3). However, formulating the correct evidence-based question, locating and/or extracting the relevant literature, and formulating the best opinion or intervention recommendation based on that literature has, until recently, continued to be left up to the individual clinician working on his or her own. An extensive literature documents remarkable variation in clinical practice, suggesting that patients with the same conditions but living in different communities cannot expect the same intervention. If there is a "best approach" to the care of a particular condition, not all patients are getting it: A recent medical record review study indicates a substantial discrepancy between recommended care and practice (7). Related findings (e.g., 8) were highlighted in the Institute of Medicine report *Crossing the Quality Chasm* (9) as a factor in the failure to routinely deliver proven protocols for prevention, acute care, and chronic disease management.

To assist clinicians in this process of routinely delivering proven protocols, many professional societies, foundations, and other organizations have set up explicit and formal review systems, in which evidence is reviewed and specialty-based intervention recommendations or practice guidelines are produced (10). Each review process differs with respect to the interventions it covers, the way in which the reviews are conducted, the rules used to judge an intervention as evidence-based, and the way in which these reviews are communicated to influence patient care. Evidence-based recommendations, or practice guidelines, are often distinguished from consensus practice guidelines that are informed by relevant research but not necessarily guided by systematic evidence reviews. Many professional societies or medical specialties continue to have consensus panels for practice recommendations (e.g., American Heart Association).

This primer of systematic evidence review systems was designed to describe how each of the major review systems operates and the types of interventions they cover. Researchers will be interested in this information because these review systems provide instruction in the design and reporting of *behavioral medicine interventions*—defined as interventions that alter behavioral determinants of acute or chronic diseases and conditions, and thus promote health and prevent disease. Behavioral medicine clinicians will be interested in this primer because it will facilitate their access to intervention reviews relevant to their areas of expertise. Finally, the review systems reviewed can (and do) influence treatment reimbursement practices, and accepted standards of treatment care are used for accreditation and certification, making this primer of interest to policymakers and public health advocates in the behavioral medicine community as well.

There are several established, rigorous review systems but, due to space limitations, the review systems of only five organizations are described herein: The Division of Clinical Psychology of the American Psychological Association, the American Psychiatric Association, the Cochrane Collaboration, the Centre for Evidence-Based Medicine, and the Evidence-Based Medicine Tool Kit of the Evidence Based Medicine Working Group at the University of Alberta. These five review systems are among the most evolved/articulated and are, therefore, those from which the behavioral medicine community can learn efficiently about processes that have been found to be successful in evidence-based review systems. The first three systems cover several substantive areas of practice relevant to behavioral medicine, and the last two review systems include methods of review that may be used by behavioral medicine practitioners and patients. The selected review systems and their associated Web sites are presented in Table 1.

OVERVIEW OF SELECTED EVIDENCE-BASED REVIEW SYSTEMS

Summaries of the Available Evidence

The first three organizations described herein have promoted and organized efforts to synthesize available evidence into systematic reviews.

American Psychological Association, Division 12, Society of Clinical Psychology

Who are they? Multiple task forces of dedicated professionals within Division 12 (Society of Clinical Psychology) of the American Psychological Association (APA) have contributed to the effort of reviewing the evidence base of psychotherapy treatments. The evolving history of this effort, including the achievements of the individual task forces, is described next in detail.

In 1993, the Task Force on Promotion and Dissemination of Psychological Procedures (11) was initiated and chaired by a clinical psychologist, Dianne Chambless. The task force's charge was to review and assess the evidence base for empirically supported treatments (ESTs) for adult patients. The impetus for clinical psychology to begin its own evidence-based review system was the desire to increase the knowledge, awareness, training, and use of evidence-based psychotherapy (12,13).

Members of this original task force were clinical psychologists from psychology departments, medical schools, and private practice, as well as experts in knowledge exchange. They were chosen to represent various therapy theories, including psychodynamic, interpersonal, cognitive, and behaviorist. During their tenure, they first created a set of criteria for evaluating therapy interventions, then asked reviewers to apply these criteria to the published evidence. In 1995, they reported that 25 treatments had met the evidence burden to be called an EST (13). By 1998, 71 treatments had met the EST burden (14), meaning that they had at least two good between-group design experiments or a large series of single-case design experiments that demonstrated efficacy (see Table 1).

A second task force, chaired by Suzanne Bennett Johnson, was formed to review therapies with an emphasis on prevention programs for children (the Task Force Effective Psychosocial Interventions; A Lifespan Perspective). This task force con-

TABLE 1
Selected Evidence-Based Review Systems: Accessing and Grading the Evidence

Name of Review Group	*How Do You Access These Reviews?*	*How Do They Grade the Evidence?*
APA Division 12 Taskforce on Empirically Supported Treatments (14)	http://www.apa.org/divisions/div12/rev_est/index.html and various publications including *A Guide to Treatments That Work*	Well-Established Treatment: I. At least two good between-group design experiments demonstrate efficacy OR II. A large series of single case design experiments must demonstrate efficacy. III. Experiments must be conducted with treatment manuals or equivalent clear description of treatment. IV. Characteristics of samples must be specified V. Effects must be demonstrated by at least two different investigators/teams. Probably Efficacious Treatment: I. Two experiments must show the treatment is superior to waiting-list control group OR II. One or more experiments must meet the Well-Established Treatment Criteria I, III, and IV, but V is not met OR III. A small series of single case design experiments must meet Well-Established Treatment Criteria. Experimental Treatments: Treatment not yet tested in trials meeting task force criteria for methodology.
American Psychiatric Association	APA Practice Guidelines can be ordered from http://www.appi.org or one can access Practice Guidelines produced in the past 2 years at http://www.psych.org/clin_res/prac_guide.cfm. They are also published in the *American Journal of Psychiatry.*	[I] Recommended with substantial clinical confidence. [II] Recommended with moderate clinical confidence. [III] May be recommended on the basis of individual circumstances.
Cochrane Collaboration	Accessed at *The Cochrane Library,* http://www.update-software.com/cochrane/ Quarterly published new and updated reviews are available electronically on CD-ROM and the Internet (subscription required). Abstracts can be searched without a subscription.	There is no one standard across Cochrane reviews for grading evidence. However, in addition to stating the overall conclusion regarding the research evidence, each Cochrane review includes a discussion of the methodological quality of the relevant RCTs.
Centre for Evidence-Based Medicine	One can access their critical appraisal worksheets by going to the site http://www.cebm.utoronto.ca/, clicking on "Teaching EBM" and then to "Critical Appraisal Worksheets."	The pages on Practising EBM/Critical Appraisal of the Evidence, using clinical scenarios and the concepts of validity and importance, help the clinician understand and apply important research concepts and interpretation of results to arrive at a decision.
Evidence-Based Medicine Tool Kit	The worksheets for clinicians can be accessed by going to their Web site: http://www.med.ualberta.ca/ebm	This information is from Guyatt et al. (48) but not applied to clinician's Worksheets on the Tool Kit's Web site. **A1**: RCTs, no heterogeneity, CIs clear threshold NNT; **A2**: RCTs, no heterogeneity, CIs cross threshold NNT; **B1**: RCTs, heterogeneity, CIs clear threshold NNT; **B2**: RCTs, heterogeneity, CIs cross threshold NNT; **C1**: Observational studies, CIs clear threshold NNT; **C2**: Observational studies, CIs cross threshold NNT

Note. RCTs = randomized controlled trials; CIs = confidence intervals; NNT = number needed to treat.

sisted of two committees: Section 1 (Clinical Child Psychology) and Section 5 (Society of Pediatric Psychology).

The Section 1 committee (Clinical Child Psychology) used less stringent criteria than the original Division 12 committee for evaluating if a therapy was an EST (e.g., therapy manual not necessary). Their objective was not to conduct a comprehensive review of the literature on interventions in general but to focus on interventions for specific health problems among children and/or adolescents (e.g., comprehensive treatment programs for children with autism). This process enabled them to identify ESTs as well as gaps in the intervention literature for specific health problems. Their work was presented as a symposium at the 1996 Annual Convention of the APA in Toronto and published in a special issue of *Journal of Clinical Child Psychology* (1998, Vol. 27, No. 2; 15).

The Section 5 committee (Society of Pediatric Psychology) also used the same criteria as Section 1 committee for evaluating if a therapy was an EST but required fewer participants in the reviewed studies of rare chronic illness populations (16). The committee published reviews on recurrent pediatric headache, recurrent abdominal pain, procedure-related pain, and disease-related pain, with commentaries in a special issue of *Journal of Pediatric Psychology* (1999, Vol. 24, No. 2).

Division 12 then formed a third task force, the Task Force on Treatments that Work, chaired by Martin Seligman, whose mandate was "to publish information for both the practitioner and the general public on the random assignment, controlled outcome study literature of psychotherapy and of psychoactive medications" (17). This task force commissioned an interdisciplinary book edited by Peter Nathan and Jack Gorman (10) that included 27 reviews by psychologists and psychiatrists on the psychological and pharmacologic intervention outcome literature for psychiatric disorders. A revised and updated edition of this book, which included 28 reviews, was published in 2002 (18). Of note, these editions are neither endorsed nor published by Division 12, although originally they were generated from Division 12 activities; the lack of endorsement resulted from the APA Board of Directors' decision to neither endorse nor sanction any set of treatments out of concern that such endorsement might disenfranchise some APA members.[2]

Moreover, APA emphasizes clinical judgment in context (including factors such as therapist expertise in the modality and patient characteristics) versus adherence to evidence-based summaries whose content may be biased by their creators (19). Other organizations continued to develop and endorse specific evidence-based standards; in response, the APA Board of Professional Affairs (BPA) allocated resources (20) to the creation of development and evaluation criteria for practice guidelines (21) and for treatment guidelines (22) to assist APA members.

Because APA as an entity chose not to review the evidence base for psychological therapies, Division 12 created a standing committee in 1999 to continue identifying ESTs (12). A spin-off of that committee is a Section 2 (Clinical Geropsychology) committee chaired by a clinical psychologist, Forrest Scogin. This committee is currently testing new coding criteria authored by John Weisz and Kristen Hawley; review teams will soon begin coding the EST status of various interventions for older persons with psychological difficulties (e.g., anxiety, sleep, caregiver stress, etc.).

How does the review process work? Each task force established very specific criteria (e.g., randomized controlled trials from two different groups with a total of 30 or more participants or a single case design; must have a treatment manual) for declaring the specific level (e.g., Well-Established, Probably Efficacious, etc.) of an intervention (see Table 1). Reviewers were asked to apply these criteria to the existing literature and report to which level of evidence an intervention is currently assigned. The criteria for inclusion were altered from one task force to the next; of note, the criteria of the first two task forces focused on the level of the evidence base for a treatment, whereas the criteria of the third focused on the quality of the individual studies (12).

What translational and sustainable steps have they taken? No documentation could be found about the level of financial support for this endeavor; therefore, funding and sustainability of these review processes may be an issue. Committee members and reviewers do not appear to be compensated in any way, and the formation of three separate task forces implies that the sustainability of this process has proved a challenge. However, the work of these previous task forces is easily accessible: Division 12 has provided and maintains a consumer-friendly Web site (11) in which an educated consumer can review which treatment is considered to be evidence based.

Division 12 also has been concerned about the level of training in these evidence-based therapies for future clinical psychologists. Guidelines, albeit nonempirically based, for how to integrate EST-training into various levels of professional development are available (23). Of note, only 28% of the internship sites approved by the Association of Psychology and Postdoctoral Internship Centers were teaching one or more Well-Established Treatments (for a minimum of 15 hr) as part of their training program in 2002 (24). However, the effort to monitor training and therefore alert internships and their directors of this problem appears to be ongoing. Perhaps because of this lack of training in ESTs, the uptake of ESTs into typical practice has not seemed imminent (25). This situation also continues in the medical profession (9).

How does one find behavioral-medicine-specific reviews within this system? The value of these reviews for behavioral medicine is that they are reviews of interventions used by some behavioral medicine practitioners. Unfortunately, they are not disease specific, but they do suggest which therapy interventions or modalities are currently supported, which may be of interest to behavioral medicine practitioners or researchers for testing within our own field. For a description of how to use this evidence review system, as well as the application of the review systems to a published case study of an individual with heart disease and depression (26) see Table 2.

[2]Thank you to anonymous reviewers for making this point.

TABLE 2
Application of Each Review System to Case Study Example (Described in Table Footnote)

Name of Review Group	*How Do You Use This Review System to Generate Depression Treatment Options?*	*Critique From the Therapist's Perspective*	*Critique From the Client's Perspective*
American Psychological Association Division 12 Taskforce on Empirically Supported Treatments (14)	1. Go to the APA Division 12 Taskforce Web site: http://www.apa.org/divisions/div12/rev_est/index.html 2. Select "depression" 3. Choose from among Well-Established Treatments: Cognitive therapy, behavioral therapy, and interpersonal therapy; and Probably Efficious Treatments: brief dynamic therapy, self-control therapy, social problem solving therapy (this information is also listed in Table 2 of 12, p. 692). 4. No discussion of medical comorbidities	1. No treatment decision processes explicated 2. No consideration of therapist expertise 3. No discussion of patient preferences	1. Some patient education materials available 2. No treatment decision processes explicated
American Psychiatric Association	1. Identify the appropriate guideline at http://www.psych.org/psych_pract/treatg/pg/prac_guide.cfm. The last 2 years are available online, or they can be ordered, or they can be accessed through the *American Journal of Psychiatry* 2. Read the guideline (in this case, the Practice Guideline for the Treatment of Patients with Major Depressive Disorder, 2nd ed.) 3. Note that the Summary of Treatment Recommendations suggests that cognitive behavioral therapy, interpersonal therapy, and psychodynamic therapy are recommended [II], although psychodynamic therapy requires additional study. During the acute phase a psychotherapy and pharmocotherapy, together or separate [I] is recommended. 4. Assess which of the recommended treatments best fit the experiences of this client (the Specific Clinical Features section may facilitate that)	1. Some treatment decision processes explicated 2. Some consideration of therapist expertise 3. Some discussion of patient preferences 4. No discussion of medical comorbidities	1. No patient education materials available 2. No treatment decision processes explicated
Cochrane Collaboration	1. Visit Cochrane Web site at http://www.cochrane.org 2. Identify Cochrane reviews or abstracts on topic of depression through (a) individual abstract search or (b) particular Collaborative Review Groups (e.g., the Cochrane Heart Group, the Cochrane Hypertension Group, the Cochrane Depression, Anxiety and Neurosis Group, the Consumer Network). For this example, two Cochrane Reviews were identified: The first one was on antidepressants in medical illness (i.e., not behavioral medicine), and the second was on depression and congenital heart disease (i.e., not relevant to this patient). In addition, there are two published protocols (outlines of reviews in progress)	1. Some treatment decision processes explicated 2. No consideration of therapist expertise 3. No discussion of patient preferences 4. Some discussion of medical comorbidities	1. Some patient education materials available (i.e., consumer summary of published reviews) 2. No treatment decision processes explicated

Centre for Evidence-Based Medicine	1. Go to http://www.cebm.utoronto.ca 2. Select "Practicing EBBM" from left margin 3. Follow each step starting with "Formulating a question" through "Evaluation" of the application of evidence to treat particular clients (see also 42)	1. Treatment decision processes explicated 2. No consideration of therapist expertise 3. Some discussion of patient preferences 4. Some discussion of medical comorbidities 5. No evidence reviewed on depression treatment	1. No patient education materials available 2. No treatment decision processes explicated
Evidence-Based Medicine Tool Kit	1. Conduct a Medline search for related systematic reviews (search tips available at http://www.med.ualberta.ca/ebm/sysrevbasicstrategies.htm) 2. Appraise the identified systematic reviews using clinician-focused worksheets at http://www.med.ualberta.ca/ebm	1. Treatment decision processes explicated 2. No consideration of therapist expertise 3. No discussion of patient preferences 4. Some discussion of medical comorbidities 5. No evidence reviewed on depression treatment	1. No patient education materials available 2. No treatment decision processes explicated

Note. Case study (adapted from 26): A 56-year-old man was hospitalized with acute myocardial infarction. He had a history of hypertension and hyperlipidemia. At a 3-week follow-up visit, he complains of boredom, frequent tears, depression, disgust, and guilt (e.g., for not taking care of himself well enough to avoid a heart attack). When interviewed, he reported no changes in appetite, weight, or sleep habits; he also said that he had not experienced suicidal thoughts. He is diagnosed with Major Depressive Disorder.

American Psychiatric Association

Who are they? In 1991, the American Psychiatric Association (27) embarked on an evidence-based review process by invoking through its Assembly and Board of Trustees the call to develop Practice Guidelines. Practice Guidelines (28), as defined by the American Psychiatric Association, are systematically developed documents that are provided in a standardized format. Content areas addressed by this review system include treatment of patients with Alzheimer's disease and other dementias of late life, HIV/AIDS, substance use disorders, personality disorders, mood disorders, psychotic disorders, and so forth.

The American Psychiatric Association Steering Committee on Practice Guidelines oversees the development of these guidelines (29). The committee selects topics for Practice Guidelines using the following criteria: (a) degree of public importance, (b) relevance to psychiatric practice, (c) availability of information and relevant data, (d) availability of work already conducted that would be useful in developing the practice guideline, and (e) need for increased psychiatric attention and involvement in that area that would be helpful for the field.

The Steering Committee then selects work group members who are knowledgeable in the priority area and who regularly provide patient care (typically, psychiatrists in clinical practice, but also academicians or researchers). Any work group members with a possible conflict of interest or bias that may affect their scientific objectivity (such as receiving income from an intervention discussed in the Practice Guideline) are asked to decline. The mandate of each work group is to identify, evaluate, and summarize existing research into Practice Guidelines to suggest empirically based treatments to assist psychiatrists in clinical decision making.

How does the review process work? The Practice Guidelines are developed as follows (29): Invited work group members develop a preliminary outline with the Department of Quality Improvement staff, then they conduct a literature review, including a description of a search strategy, sources used to identify studies, criteria for publication selection, review methods, and methods of cataloging. The evidence reviewed is randomized double blind clinical trials, randomized clinical trials, clinical trials, cohort and longitudinal studies, case-control studies, reviews with secondary data analysis, reviews, and other. Three drafts of the review are written and revised (i.e., Draft 1 based on the evidence tables and outline; Draft 2 based on comments by the review group and Steering Committee; Draft 3 based on comments by the work group, the Steering Committee, 50 experts in the subject area, the Board of Trustees, Assembly, Joint Reference Committee, Council on Quality Improvement, Council chairs, Commission on Psychotherapy by Psychiatrists, Committee on Women, District Branches, *American Journal of Psychiatry*, and 100 representatives of related organizations). The third draft is submitted to the American Psychiatric Association for approval, approved, and then submitted to *American Journal of Psychiatry* for publication (29). The final Practice Guideline includes a summary entitled "Treatment Recommendations," with confidence ratings for each of the particular treatments (see Table 1).

Continuing medical education (CME) questions and a quick-reference guide are written and published with approval by the Steering Committee. Thus far, 12 Practice Guidelines have been published. Of these, 3 are in their second edition, 3 others are currently being revised, and 2 more are being written at the time of submission.

What translational and sustainable steps have they taken? The APA widely circulates the Practice Guidelines to the professionals in the field of psychiatry (29). Dissemination includes the publication of Practice Guidelines in the *American Journal of Psychiatry* and the American Psychiatric Publishing, Inc., produces a digest of all of the guidelines biannually. Moreover, the guidelines are regularly updated.

Students and professionals in the field of psychiatry are tested on information from the Practice Guidelines for both their Psychiatry Resident In-Training Examination and their recertification exams. Further, online CME courses are provided for psychiatrists interested in learning evidence-based approaches to treatment, ensuring their transcendence from the written page to clinical practice.

How does one find behavioral-medicine-specific reviews within this system? Similar to the reviews by the Division of Clinical Psychology of the American Psychological Association, the value of the Practice Guidelines for behavioral medicine is that they are reviews of modalities sometimes used by behavioral medicine practitioners and evaluated by behavioral medicine researchers. Because the Practice Guidelines are based in the medical literature and the Division of Clinical Psychology reports are based in the psychological literature, it is advisable to consult findings from both review systems on the topic of interest.

Another factor that distinguishes the Practice Guidelines from the Division 12 products is that in addition to summarizing the evidence, Practice Guidelines include a section called "Specific Clinical Features Influencing the Treatment Plan," which considers other treatment-relevant characteristics of clients such as sociodemographic characteristics and comorbidities. As behavioral medicine practitioners and researchers often work with clients with comorbities, it is expected that this section would be of particular interest (see case study example in Table 2).

Cochrane Collaboration

Who are they? The Cochrane Collaboration (1) is a nonprofit organization whose mandate is "to help people make well informed decisions about health care by preparing, maintaining, and ensuring the accessibility of systematic reviews of the effects of health care interventions." There are 10 principles that guide the Collaboration's work: collaboration, building on the enthusiasm of individuals, avoiding duplication, minimizing bias, keep-

ing up to date, striving for relevance, promoting access, ensuring quality, continuity, and enabling wide participation (30).

According to the Cochrane Collaboration brochure (30), the Cochrane Collaboration was developed in response to the call of Archie Cochrane, a British epidemiologist, for systematic reviews of randomized controlled trials in the field of health care (31,32). "The Cochrane Center" was first opened in the United Kingdom in 1992. The first annual Cochrane conference, "Doing More Good Than Harm: The Evaluation of Health Care Interventions," was held at the New York Academy of Sciences in 1993 (33). At that meeting, the Cochrane Collaboration was founded by 77 professionals from differing disciplines and from 11 countries.

The Cochrane system has evolved into multiple sets of entities that utilize and advance the growing expertise in systematic reviews. The Cochrane Collaboration Steering Group, Subgroups, and Secretariat oversee the work by these entities. First, there are almost 50 Collaborative Review Groups (CRGs); each focuses on a specific health care problem, such as breast cancer or tobacco addiction (34). Second, the Methods Review groups (e.g., Nonrandomised Studies, Statistical Methods) outline and evaluate methods for conducting systematic reviews within the CRGs. The third set of Cochrane entities are called Cochrane Fields or Networks; they focus on the evidence base for health dimensions that are not disease or health problem specific, such as the setting of care (e.g., primary care) or the type of patient (e.g., elderly). Last, the mission of the fourth entity, the Cochrane Consumer Network, is to be attentive and responsive to the needs of patients through the work conducted by the Cochrane Collaboration. The work of these entities of the Cochrane Collaboration is facilitated through advocacy and training by 15 Cochrane Centers that are geographically located throughout the world (30).

How does the review process work? The randomized controlled trial is the type of evidence typically reviewed by Cochrane Collaboration reviewers. Each review is approved and then conducted by one of the 50 CRGs, which typically comprises researchers, health care professionals, patient consumers, and others. With the assistance of Cochrane Center staff and the most recent edition of the *Cochrane Reviewers' Handbook* (available at www.cochrane.org), a volunteer CRG reviewer produces an a priori *protocol* for the planned review. The protocol outlines the proposed review, including the objectives, criteria for study inclusion, search criteria, review methods, tables, references, and acknowledgments/conflicts of interest. The protocol is amended, if necessary, after external review by a Cochrane editorial team and reviewers, and then reviewers proceed with the review. Reviewers, mostly volunteers, have 2 years from the published date of the protocol to complete the review. The review itself is then subjected to peer review, revised as necessary, and published in *The Cochrane Library.* Published reviews are updated regularly, based on feedback from users of the library and the availability of newly published evidence. Of note, over 1,800 Cochrane reviews have been published, and over 1,300 protocols are currently in progress.

What translational and sustainable steps have they taken? The Cochrane Collaboration has been in existence for just over 10 years. Funding for the Cochrane Collaboration has come from a wide variety of international public institutions and organizations, including government agencies and universities, but there is growing interest in a role for nonprofit, private, research-funding organizations and industry to support the Collaboration's work. For example, the European Union's Biomed programs have been involved in efforts to develop more complete registers of the controlled trials that form the basis for Cochrane reviewers' work (1). Of interest, the Cochrane Collaboration was run as a volunteer organization, without infrastructure financial support for a number of years. However, even with the infrastructure support now available, reviews are almost always conducted by professionals volunteering their time, suggesting that sustainability may be at some risk (35).

There has been concern about the slow success of achieving Cochrane's objective of increasing the translation of research to practice (36). The Cochrane Abstracts are available at no cost through the Internet. Cochrane reviews are always published in the online *Cochrane Library* (subscription necessary to access) and occasionally copublished in peer-reviewed medical journals with the stipulation of nonexclusive copyright to ensure that the reviews remain accessible on the Internet (37). Cochrane reviews include a section entitled "Implications for Practice." Nevertheless, anecdotal evidence from clinicians suggests that the format of the reviews is unwieldy (35). Further, the reviews are not systematically adopted or endorsed by any professional society or formal organization to help bring the evidence into clinical practice.

Finally, in efforts to translate and disseminate their work, the Consumer Network of the Cochrane Collaboration (38) provides consumer-oriented summaries of Cochrane reviews. In addition, consumers can provide feedback on the reviews and participate in online discussion groups. The impact of these activities is unknown; to our knowledge, there are not yet publications about the changes in consumer demand, satisfaction, or lack thereof that result from this Cochrane Network.

How does one find behavioral-medicine-specific reviews? Members of various Collaborative Groups of the Cochrane Collaboration have conducted behavioral-medicine-specific reviews, typically in the form of comparisons to medical techniques or pharmacalogic care. In addition, most reviews include surveillance of both medical- (e.g., Medline) and psychology-based (e.g., PsycInfo) databases. Although several Collaborative Groups appear more likely to produce behavioral-medicine-specific reviews than others, currently behavioral medicine researchers, clinicians, and potential patients can only identify behavioral-medicine-specific intervention reviews in their area of interest by searching over 1,800 abstracts. See Table 2 regarding how to apply this system to a case study.

Methods for Independent Review of the Evidence

Unlike the three review systems explicated previously, the following two review systems are designed for use by individual

health care practitioners so that they can (a) review the summaries of studies produced by systematic reviewers (e.g., Cochrane affiliates) or (b) conduct their own review of studies identified in their specific searches.

Centre for Evidence-Based Medicine

Who are they? David Sackett was one of the first physicians to formally inaugurate the call for EBM practices. He and others have authored one of the most popular books in the area of EBM entitled, *Evidence-Based Medicine: How to Practice and Teach EBM* (4). His Centre for Evidence-Based Medicine (CEBM; 39) is located at University Health Network, Mount Sinai Hospital in Toronto, Canada. The goal of the CEBM Web site "is to help develop, disseminate, and evaluate resources that can be used to practice and teach EBM for undergraduate, postgraduate, and continuing education for health care professionals from a variety of clinical disciplines." This center is geared toward helping clinicians apply evidence-based practices within health care settings; clinical scenarios that serve as application exercises are included on the CEBM Web site (39).

How does the review process work? The focus of this review system is on the process to be used by a clinician in finding an evidence base for the diagnosis or treatment of an individual patient. Thus, the mandate of the system is to help the clinician formulate answerable clinical questions, search for the best evidence, critically appraise the evidence, apply the evidence to patients, and then conduct a self-evaluation. Unfortunately, the pages on "searching for the best evidence" and "applying evidence to patients" are under construction and not available at the time of submission. However, parts of the process are now in place, and a tutorial exists to allow the clinician to locate, evaluate, and apply a treatment to a patient. Criteria for appraising the evidence include determining if the evidence is both *valid* and *important.* Worksheets with a series of specific questions help guide the clinician in determining both importance and validity, and are provided for diagnosis, prognosis, therapy, and harm (www.cebm.utoronto.ca/teach/materials/caworksheets.htm).

What translational and sustainable steps have they taken? The CEBM is funded by Mount Sinai Hospital–University Health Network, Department of Medicine, and has been in existence for many years, suggesting that this is a sustainable effort. There are continuing education programs set up by this Centre as their effort to translate and educate physicians in the use of EBM (see Table 2). For example, there is a link on the first page to the Knowledge Translation Program (39) that is sponsored by Continuing Education, Faculty of Medicine at the University of Toronto. This program is run by a network of researchers who are dedicated to developing, testing, and implementing evidence-based strategies to bridge the gap between "good care and best care." The Knowledge Translation Program offers a series of workshops, rounds, trainings, and publications to further their mission.

Evidence-Based Medicine Tool Kit

Who are they? The Evidence-Based Medicine Tool Kit (40) was developed in the fall of 1996 and put online soon after by the Evidence-Based Medicine Working Group at the University of Alberta to help clinicians evaluate research for application to their individual practice questions. The critical appraisal tools were based, in general, on the original Users' Guides series of 33 articles published in the *Journal of the American Medical Association* from 1993 to 2000 (41) to aid the individual clinician in the use of EBM; the search strategies, introductions, glossaries, and so forth were developed at the University of Alberta. Of note, the *JAMA* Users' Guides have been revised and republished in book form (42) and as an online product (43) that is available through paid subscription only.

The authors of the current Web site are Professors of Medicine, Epidemiology, and Public Health Sciences, with the aid of a medical librarian. Of note, one of the current authors was affiliated with the Evidence-Based Medicine Working Group, located at McMaster University, a group that endorsed a program for incorporating evidence review training into existing medical curricula (6).

The current contributors were united by a mutual interest and a mutual perception that a simple guide would be a helpful resource, both for residents and for graduate students in clinical epidemiology. In their revision of the Tool Kit Web site, the basic guidelines for critical appraisal will remain, but the Evidence-Based Medicine Working Group name will be removed as a cosponsor (44).

How does the review process work? The clinician is taken through a series of questions to determine the responses: Are the results from articles valid? What are the results? Will the results help in patient care? Terms that may be unfamiliar to the user are linked to the clinical epidemiology and Medline glossaries. The accompanying worksheets serve as a step-by-step guide through this process. Worksheets are available on finding and using articles about diagnostic tests, therapy, prognosis, harm, Clinical Practice Guidelines, and economic analysis.

What translational and sustainable steps have they taken? The purpose of the Tool Kit is to teach medical students, residents, practitioners, and faculty unfamiliar with EBM the basic principles of evidence-based practice in the simplest way possible to ensure the translation of these principles into everyday practice (44; see Table 2). Therefore, the worksheets included in the Tool Kit are clear, concise, and specifically developed for clinician use for applying evidence to their practice.

COMMENTARY

The review groups/systems described here have different audiences and different content, but they all aspire to cross the divide between research and practice through the education of health practitioners on how to apply the available research evidence in their practice. The next question is: What can the field of behavioral medicine glean from these different approaches and what can be chosen from within their toolboxes for use

within our field? Next, we describe the strengths and weaknesses of each of the review systems from the perspective of behavioral medicine.

The Evidence-Based Task Forces of Division 12 of the American Psychological Association have cumulatively taken on the reviews of intervention studies in multiple interest areas in clinical psychology and have published these efforts in affiliated journals. In addition, the task forces themselves are self-critical, enabling the evolution of the Division 12 criteria and the method for future reviews of the literature. For example critiques included lack of coding rules and a common outcome, as well as unclear definitions of *treatment* and *empirical support* (45). Two impressive products of this effort by Division 12 are the *Guide to Treatments that Work*, currently in its second (substantially revised) edition (18), addressed to researchers and practitioners, and the Task Force Web site (11), addressed to mental health care consumers.

Evidence to practice is the goal of the American Psychiatric Association Practice Guidelines. A helpful feature in this review system that is not found in the other review systems discussed is the inclusion of "Specific Clinical Features Influencing the Treatment Plan" (29). This section acknowledges that factors, such as psychiatric or medical comorbidities and sociodemographic characteristics, may influence the recommended intervention. This feature is of particular use to behavioral medicine because it acknowledges the tenuous relationship between an evidence base and application to practice and provides the clinician with information about some of the variables that should be considered when formulating an individual treatment plan.

The Cochrane Collaboration has several points of interest to behavioral medicine. For process, the requirement of a well-defined, a priori (published) protocol in which one describes the research question, eligibility criteria for study inclusion, and search strategies prior to the review is an excellent method for reducing potential duplication of effort within the field. In addition, the regular publication of results in *The Cochrane Library*; the re-review of already extant reviews; and the accessibility of the online review in almost all universities, medical schools, and hospitals increases both the visibility and theoretical translation of their findings into practice.

Another strength of the Cochrane Collaboration systematic review approach is the strong methodological basis (manual for conducting reviews on the Web; 46), strong emphasis on empirical demonstration/evolution of methods, and emphasis on high-quality evidence (controlled clinical trials). This can also be a shortcoming, especially if these are not available and/or feasible for some behavioral medicine interventions. Finally, the ability to find evidence-based reviews of relevance to behavioral medicine is compromised, as these are spread throughout the Collaborative Review Groups and are not currently indexed in any systematic fashion.

Unlike the Cochrane Collaboration and the Division 12 review systems in which clinicians read reports of reviews, the CEBM empowers the clinician to conduct her or his own review of the literature. The process by which an individual clinician can use evidence to decide on the usefulness of an intervention is provided and is applicable to the search for an evidence-based behavioral medicine intervention. Evidence resources (textbooks, Web-based information, and CDs) are also included on the Web site, primarily for common and urgent medical conditions (39).

Last, the Evidence-Based Medicine Tool Kit, a Web site resource for health care providers who want to review the research evidence for a particular clinical inquiry, provides a listing of Sources of Primary Literature, which describes many of the biomedical databases available. This site also provides both a clinical epidemiology glossary and a Medline glossary to help define and explain the many scientific terms used throughout the site.

Together these review groups have contributed to a distillation of research findings and the empowerment of health care providers in many different content areas across psychological (e.g., American Psychiatric Association) and physiological (e.g., Cochrane) domains. Several of them have created grading systems to evaluate the evidence itself (e.g., American Psychology Association, Division 12 Taskforce) or to quantify level of recommendation of a particular intervention (e.g., American Psychiatric Association) (see Table 1). All of them have attempted to make their work (and worksheets—in the case of the Evidence-Based Medicine Tool Kit) available to the public via distribution on the Internet (see Table 1). However, the majority of evidence review systems have a clear mandate to present evidence to one professional audience. For example, the American Psychological Association Division 12 guidelines are written specifically for clinical psychologists. Similarly, psychiatric practice guidelines only review evidence relevant for the practice of licensed psychiatrists. Further, in the prior two examples, the patients treated in these evidence bases are not typically suffering medical and psychosocial comorbidities. Although CEBM and the Tool Kit allow clinicians to potentially narrow their review of the evidence to locate behavioral medicine (i.e., interdisciplinary) interventions for these patients, the evidence itself is neither reviewed nor graded in these systems. The Cochrane Collaboration review system allows the possibility of reviewing interdisciplinary interventions for medically and psychosocially comorbid patients; however, at present, there is no system for accessing this specialized evidence base without surveying the information from all Groups and Fields. This article is the first step in developing that system.

SUMMARY AND FUTURE DIRECTIONS

In this article we address a topic of considerable importance to behavioral medicine clinicians, researchers, educators, and policymakers, as evidence-based review systems could help provide the evidence necessary for the translation of the best behavioral medicine research into practice, reimbursement, and improved patient care. Review systems that provide a synthesis of the evidence amassed for the practice of a particular area of medicine, such as behavioral medicine, enable clinicians to treat patients with the best practices available and to educate patients, other health care providers, and reimbursement systems about

why these practices are optimal. Several of the systems reviewed herein have set up continuing education programs to educate clinicians in the use of the ever-evolving evidence. Evidence-based review systems also assist the researcher in determining the gold standard against which to compare interventions and encourage the researcher and the clinician to consider methodological issues that need to be addressed if we are to build evidence-based behavioral medicine. Finally, evidence-based reviews hold the promise of providing information to assist policymakers and public health advocates to be able to better determine which behavioral medicine programs should be reimbursed and which practice guidelines should be used when considering accreditation and certification. Because there is no evidence-based system specifically devoted to behavioral medicine, understanding the potential contributions of the available review systems can contribute to our effort as a field to join or even, dare we say, improve on the existing evidence-based review systems.

For any evidence-based review system to reach its potential, several challenges must be addressed. First, EBM assumes that the application of clinical guidelines results in better patient outcomes. However, we have little evidence at this point in the evolution of this science to support this assertion. Program evaluation research is clearly needed to more definitively test the link between the applications of best evidence to improved patient outcomes. Second, we know little about the adoption of evidence-based guidelines and their likelihood of use in practice in other fields, and certainly, to our knowledge, this is uncharted within behavioral medicine. Third, development of evidence-based guidelines has largely been a volunteer exercise, leading to questions of sustainability and timeliness. Unfortunately, financial or other support for the development of guidelines is frequently difficult to obtain. Some evidence-based guidelines have been supported by the pharmaceutical industry or by medical subspecialty societies. A key advantage to some of the review systems described here has been their diligent efforts to avoid and/or disclose conflicts of interest. And, we think such disclosures are crucial if evidence-based reviews are to be credible. We must, however, recognize that investment is necessary to sustain the development of high-quality, nonpartisan reviews. And, sadly, the answer to this dilemma—the need for investment and the concern for conflicts of interest—has not yet been adequately solved by any review system.

A fourth concern is how evidence-based reviews are disseminated. At present, very few behavioral medicine specialists know how to access relevant behavioral medicine reviews. The goal of this article was to facilitate this dissemination process.

The evidence-based review movement seems to be gaining momentum. It is likely that many resource allocation systems will depend on the quality of reviews. For example, evidence-based reviews are now routinely considered in decisions by the Center for Medicare Services, the Food and Drug Administration, and by state Medicaid programs. Whether or not we like the standards that are applied for the evaluation of evidence, it is likely that studies not meeting current standards will be discounted in this review process.

The Evidence-Based Behavioral Medicine Committee Weighs In

To improve the visibility of evidence-based behavioral medicine, to contribute to and even shape the evidence-based review process, and to make our evidence more available, the Evidence-Based Behavioral Medicine Committee has concluded, in the evolution of this article, that the field of behavioral medicine would be well served by creating a Behavioral Medicine Fields within the Cochrane Collaboration.

As explained earlier in the Cochrane Collaboration section, Fields allow the focus to be on a transdisciplinary approach to health care, rather than on a specific disease, and thus ensure the surveillance of the CRGs for appropriate attention to systematic reviews of importance to that health care dimension. Thus, if behavioral medicine were to form a Cochrane Field, one of the mandates of the Field would be to interact with other health professionals involved in the production of Cochrane reviews, advocating for the representation and review of behavioral medicine interventions by the Breast Cancer Group, the Tobacco Addiction Group, the Hypertension Group, and so forth. This will be accomplished by identifying behavioral medicine experts to join CRGs and write/critique reviews. In addition, existing behavioral medicine reviews within *The Cochrane Library* will be catalogued and available on the Internet to facilitate searching and retrieving appropriate behavioral medicine evidence-based reviews.

By joining in the Cochrane Collaboration process as a Field, the behavioral medicine field can also have input into the Methods groups and other Cochrane entities that influence what constitutes evidence. Consideration of comorbidities, studies of how clinicians use evidence bases, and evidence of competence to employ an evidence-based practice are all areas in which behavioral medicine can play a lead role as the building of EBM evolves. Despite the shortcomings known and feared about the evidence-based movement (47), the committee concluded that joining the movement is the only way that behavioral medicine can gain from the strengths, and partner to overcome its limitations.

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