

Evidence-Based Geriatric Psychiatry: An Overview

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Despite unparalleled developments in medical science and a health care budget that spends more on health care for each person than any other country in the world, the American health care system is failing. As determined by the 2001 landmark study by the Institute of Medicine “Crossing the Quality Chasm,” the American health care system is plagued by high expenditures for unnecessary procedures, varies widely in quality, fails frequently to provide basic treatments supported by scientific evidence, and is “in need of fundamental redesign and reform” [1]. The more recent President’s New Freedom Commission on Mental Health made a similar determination based on a study of the mental health system, concluding, “America’s mental health service system is in shambles” [2] and that “State-of-the-art treatments, based on decades of research, are not being transferred from research to community settings. Meanwhile, many outdated and ineffective treatments are currently being actively supported” [3]. The Subcommittee on Older Adults similarly has identified serious concerns regarding quality, access, and workforce capacity, and recommended the dissemination and implementation of evidence-based practices (EBPs) as one of the most important initiatives for improving quality of care for older persons with mental disorders [4].

This article provides an overview of evidence-based medicine (EBM) and EBPs in the treatment of psychiatric disorders in older adults. The following topics are address:

- Why an evidence-based approach is important to improving outcomes for older persons with mental disorders

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- Defining evidence, evidence-based medicine, and evidence-based practices
- Evaluating the evidence
- Improving clinical practice as an evidence-based clinician
- Limitations and caveats in applying evidence-based medicine and evidence-based practices to geriatric psychiatry

Why is an evidence-based approach important to improving outcomes for older persons with mental disorders?

Older adults with mental disorders are more likely to receive inappropriate or inadequate treatment compared with younger adults who have mental disorders [5] and compared with other older adults who do not have mental disorders [6,7]. There are a variety of potential reasons for poorer quality of geriatric mental health services compared with the treatment of younger adults. Some of these reasons relate to endemic problems in the system of care, including economic barriers, physical barriers to care, fragmented services, and a workforce that is inadequately trained in geriatric mental health interventions [4,8]. Almost half of older adults with a recognized mental disorder do not seek or receive mental health services [9]. Barriers to care include a lack of economic resources, the stigma associated with mental health services, poor recognition of mental disorders in older persons, and a lack of accessible, affordable, and age-appropriate services [10–12]. Other problems in the quality of care may be related to the lack of providers with training or expertise in the assessment and treatment of geriatric mental disorders.

The challenge of providing quality mental health care for older persons is exemplified by geriatric depression in primary care. Over one third of older adults in primary care have clinically significant symptoms of depression or anxiety [13,14], and primary care physicians are the largest provider of geriatric mental health services [15]. However, the many demands in a busy primary care practice present substantial challenges to providing comprehensive and effective health care to the older patient who, typically, has multiple medical problems that demand attention and receives prescriptions of multiple medications that can interact [16]. It is in this context that the older primary care patient has an increased risk of receiving inappropriate psychiatric medications and is also less likely to be treated with psychotherapy compared with younger patients with psychiatric treatment needs [5].

One potential solution to improving the quality of psychiatric care to older adults is to escalate the training of geriatric specialists and to develop more specialty clinics. However, future projections of the geriatric specialty workforce predict a dramatic shortfall of clinicians with training in geriatrics, even under the best of circumstances [4,17]. Furthermore, even when specialized mental health clinics are available and referrals from primary

care are supported by providing transportation and timely appointments, fewer than half of older adults referred to specialty mental health clinics follow through with a referral to engage in active mental health or substance abuse treatment under these optimal circumstances [18]. A proven solution to this dilemma can be found in a quick review of the evidence base for the effective treatment approaches of geriatric depression in primary care. Integrated models of collaborative care and depression care management that apply depression treatment algorithms are now considered an evidence-based practice with broad application. A systematic review of this approach is provided by Oxman and colleagues [19], complemented by a case history presented by Unützer [20] that describes the development and implementation of evidence-based integrated models of mental health services in primary care.

In addition to problems in quality associated with shortcomings in the system of mental health care for older persons, other potential reasons for suboptimal outcomes may relate to a lack of knowledge in geriatrics. Whereas few clinicians would debate that the field of pediatrics supports a knowledge base and clinical approach that differs from adult medicine, a similar appreciation for geriatrics is not assumed widely in the treatment of older adults. Nonetheless, it is well documented that the process of aging is associated with a variety of changes in physiologic, cognitive, and social functioning that influence tolerability, safety, and outcomes of treatment. For example, responses to psychotherapeutic and psychosocial interventions vary widely in the context of age-related cognitive impairment disorders [21]. Similarly, pharmacotherapy is complicated by age-associated differences in sensitivity to medication side effects and pharmacologic response rates [22]. Further complicating the psychiatric treatment of older adults is the common presence of medical comorbidity and the increased risk of drug-drug interactions in older persons [23]. Older adults consume an average of six prescribed medications and 3.4 nonprescribed medications on a regular basis [24], increasing the risk of adverse reactions with each additional drug [25]. All of these age-associated factors argue for providing clinical services and treatments that are based on empirical studies of treatment effectiveness specifically tested in geriatric populations.

How do research findings apply to the real-world practice of geriatric psychiatry?

Efficacy versus effectiveness

Until the recent growth in geriatric mental health interventions research, clinicians were forced to extrapolate from studies with uncertain relevance to the treatment of older persons. For many years, standard drug trials typically excluded people over the age of 65 in an effort to select individuals who had the fewest confounding or complicating conditions and the lowest

risk of adverse events and withdrawals from pharmaceutical trials [22]. The past several decades have witnessed a significant growth in research on geriatric mental health interventions and services research, including treatment efficacy and effectiveness studies [19,20,26–36]. Efficacy research commonly refers to studies conducted under highly controlled conditions, using carefully selected populations, and often comparing a single active treatment to a placebo or a fixed alternative. A major aim of efficacy studies is to maximize internal validity by controlling for as many variables as possible to focus the study on a single research variable or question. For example, a study designed to test the efficacy of a new antidepressant drug in reducing symptoms of depression might first evaluate the drug in a homogeneous population of carefully selected patients with similar characteristics who have no co-occurring psychiatric or medical illnesses and who are not taking other medications. The administration of fixed doses of the experimental medication might be observed to ensure adherence and consistency, and the prescribing physician, study participants, and research raters would be blinded to any information that might include knowing if the administered drug is the experimental agent or placebo control. The prescribing physician might be a highly trained specialist with expertise in clinical trials research, providing free treatment in a university clinic, including access to experts in the field. Rigorously designed efficacy studies are considered a critical first step in establishing the likelihood that an intervention will result in the desired outcome, in comparison with placebo or a well-defined alternative under highly controlled conditions.

In contrast, a major aim of effectiveness research is to maximize external validity (or generalizability) by conducting studies under conditions that include usual patients, routine practice settings, and routine clinical providers. Effectiveness studies minimize the number of exclusionary criteria and strive to produce findings that will generalize to other people, settings, and circumstances. For example, a recent generation of effectiveness studies of geriatric mental health interventions have been undertaken to test the outcomes of treatments in routine practice settings provided by routine clinical providers. Examples of this type of study include the Clinical Antipsychotic Trials in Intervention Effectiveness (CATIE) [37], the Sequenced Treatment Alternatives to Relieve Depression (ie, STAR*D) [38], and the Improving Mood: Providing Access to Collaborative Treatment (ie, IMPACT) trials for late-life depression [20,39]. These studies have few exclusionary criteria and include older individuals with medical comorbidity and multiple medical medications and an evaluation of different treatment options provided in routine clinical practice settings. In practice, efficacy and effectiveness research lie on a continuum. For example, the CATIE study uses a randomized, controlled trial (RTC) design that emphasizes standardized implementation but also allows for a stepped approach that includes the choice of an open trial phase for individuals that have failed to respond to the randomly assigned, blinded condition. The study settings consist of university and

community clinics with patients who have a variety of comorbid conditions but have exclusion criteria beyond routine practice conditions to increase the likelihood of participation for the duration of the experimental trial.

Despite these recent advances in research methods and a growing empirical literature documenting treatment efficacy and effectiveness, an urgent need remains to accelerate the growth and investment in geriatric mental health interventions and services research. Recent evaluations of funding trends in aging-related research at the National Institute of Mental Health have shown that the number of newly awarded aging-related grants have either declined or failed to grow at a time when demographic projections predict an impending public health crisis associated with geriatric mental disorders in America [4]. It is also noteworthy that federally funded research studies require inclusion of children (or a specific explanation justifying why children are excluded from a proposed study), yet they do not require inclusion of persons over 65 years old [40]. Despite these limitations, the systematic reviews in this volume attest to how far the field has come in producing a substantial geriatric treatment literature that is well supported by scientific evidence.

What constitutes evidence?

Scientific evidence is the cornerstone of EBM, and it provides the criteria for identifying EBPs. The term evidence refers to scientific information that is produced from well-designed empirical experiments in which outcomes are carefully measured for a well-defined treatment compared with a placebo treatment, no treatment, or an alternative treatment. Well-designed empirical experiments are those in which data are collected under specified conditions that allow for clear differentiation between treatments and their comparisons, that control for differences between the study participants or recipients of the treatments, and that control for bias that study participants, practitioners, and researchers may bring to the observations collected in the experiment. The double-blind RCT is often described as the gold standard for a well-designed treatment study. Randomization of study participants is used to balance observed (measured) and unknown (unmeasured) differences that might otherwise occur between participants assigned to the intervention and comparison conditions. “Blinding” means that the raters do not know if the study participant has been assigned to the intervention or control condition, ensuring that the raters are unbiased in rating outcomes. Well-conducted RCTs include close monitoring of the interventions for fidelity to ensure that different participants in the same condition receive the same intensity, dose, and quality of the intervention, regardless of whether they receive the intervention from different providers or at different times. Finally, RCTs use reliable and valid instruments and include ongoing supervision and checks for the accuracy of assessments by different raters.

Although the double-blind, placebo-controlled RCT is considered the optimal method for establishing treatment efficacy, some of the features of this design are not possible or appropriate for some studies of interventions, and they rarely apply to the evaluation of services. First, blinding of the participants is generally impossible in psychosocial interventions in which the study participant is aware of being assigned to either the intervention or control group. Second, it is neither practical nor feasible to evaluate the large number of available interventions and the numerous combinations of two or more interventions using RCTs. Third, many RCTs that are designed to establish the efficacy of a treatment (eg, a new medication) compare the active treatment to an inactive placebo. Although this is an important step in establishing efficacy, these studies do not address the more common clinical dilemma of choosing between two alternative active treatments. More commonly, the treating clinician needs data on a head-to-head comparison of two competing treatments, yet these studies are often unavailable. Fourth, there may be significant limitations to the generalizability of data obtained in RCTs when only specific types of individuals may consent to participate in a demanding experimental protocol that requires a willingness to be randomized to very different treatment alternatives. RCTs intentionally select patients, practitioners, conditions, and settings that are highly constrained to enhance internal validity, and thus, they are limited in how well they generalize to situations of routine care [41]. Finally, double-blind, RCTs are usually expensive, difficult to conduct, and not available for most clinical situations [42]. In instances in which standard double-blind RCTs are not appropriate or available, the quality of alternative experimental data needs to be considered in the evaluation of the evidence base. A basic premise of evidence-based medicine is the use of the best available evidence in making clinical decisions. In this respect, the concept of evidence includes a spectrum of evidence from randomized clinical trials to quasi-experimental designs, observational outcome studies, and single case reports.

What is evidence-based medicine?

Sackett and colleagues [43] have defined evidence-based medicine as “the conscientious and judicious use of current best evidence from clinical care research in the management of individual patients.” In contrast to a tradition of clinical decisions based on professional experience, case anecdotes, and accumulated medical facts, EBM emphasizes the use of a systematic approach to formulating and answering clinical questions by quickly finding and evaluating the current best evidence. In medical education, this has translated into training practitioners in the real-time use of technology to find the answers to clinical questions and to critically appraise the scientific evidence supporting the effectiveness of tests, treatments, and services. Broadly defined, EBM is the use of the best available evidence by providers

and consumers and involves a collaborative process of informed clinical decision making [43–45]. More recently, the concept of EBM has been elaborated to emphasize three critical components in making clinical decisions: (1) using the current best evidence; (2) applying and adapting evidence to meet the specific circumstances and clinical needs of the patient, based on an experienced clinical evaluation; and (3) incorporating the specific values and preferences of an informed patient in a process of shared decision making. These additional distinctions are critical to understanding EBM as a process that incorporates the clinical experience of the provider and the health care preferences and values of the consumer [46–49].

Using the best available scientific evidence

The history of medicine contains numerous examples of harmful or ineffective treatments that endured as standard practice in the absence of scientifically valid evidence. Wide practice variation still exists in the rates and types of treatment for common disorders that cannot be explained by differences in illness severity or patient-based factors [50,51]. EBM assumes that treatments can be characterized accurately along a hierarchy of evidence that informs clinical decision making and supports the development of evidence-based standards for treatment [46]. This hierarchical evaluation of evidence helps to guide decisions and is complimented by clinical experience and judgment of the clinician and informed by the preferences of the health care consumer [46]. For example, a commonly used approach to ranking treatment studies defines the following hierarchy: (1) meta-analyses, systematic evidence-based reviews, or direct evidence from several double-blind randomized trials or an N of 1 controlled trial; (2) single properly designed RCTs; (3) case-controlled studies, pre-post studies or quasi-experimental studies from more than one research group; and (4) expert recommendations based on descriptive studies or clinical case reports [52]. In addition to the evaluation of the quality of study designs, the hierarchy of evidence should incorporate an assessment of the number of replications, the magnitude of treatment effects, the relevance of outcomes, and the generalizability of the findings (Box 1) [52].

An alternative approach to evaluating evidence for psychotherapy interventions is offered by Chambless and Hollon [53,54]. In this classification hierarchy, effective interventions are defined by the evidence of superior outcomes from at least two well-designed prospective randomized, controlled studies by different investigators, with clearly described or manualized interventions, or by a large series (≥ 9) of single case design experiments. Interventions that are classified as having probable effectiveness are defined by two studies showing that treatment was superior to a waiting-list control group, a small series (≥ 3) of single case design experiments, or one or more studies that meet criteria for the highest level of evidence but have not yet been replicated by different investigators.

Box 1. Hierarchical classification of evidence for effectiveness for research studies

1. "N of 1" randomized study
2. A properly conducted meta-analysis or a rigorous, systematic review of well-designed RCTs
3. Two or more well-designed RCTs conducted by different investigators involving different study samples
4. A single properly designed RCT
5. Studies without randomization (ie, single group pre-post, cohort, time series or matched case-control studies)
6. Other quasi-experimental studies from more than one center or research group
7. Expert reports and authorities' recommendations based on descriptive studies or clinical evidence

Individualizing the evidence

Contrary to common misconceptions regarding the practice of evidence-based medicine, EBM does not encourage or support the unqualified application of treatment protocols or algorithms or an otherwise "cookbook" treatment approach. Once the best available evidence is identified for a specific clinical problem, the clinician must then evaluate how data from a given study population applies to the unique situation of a specific patient. In this respect, the clinician's skills are critical to the important task of interpreting the available evidence base in the light of the individual consumer's health status, disabilities, comorbidities, and circumstances. For example, data supporting the selection of atypical antipsychotic medications to treat symptoms of psychosis need to be interpreted in the context of the clinician's evaluation of clinical indications and associated risk factors. Whereas the use of the atypical antipsychotic olanzapine may be appropriate for the treatment of psychosis in a young adult who is otherwise healthy, the treatment of the older person with comorbid diabetes and Alzheimer's dementia could be associated with an increased risk of worsening diabetic control and a greater risk of cerebrovascular accidents [31]. Individualizing the evidence is especially important in the field of geriatrics, in which medical comorbidity is the rule rather than the exception. In these instances, patients need to be provided with information that is immediately relevant to their own risks and benefits and to make truly informed choices regarding health care [55].

Incorporating patients' preferences

The early beginnings of patient-centered health care were introduced by Balint [56], who studied the patient's perspective on illness and the doctor-

patient relationship, and by Engel [57], who proposed the biopsychosocial model of illness. These perspectives underscore that effective clinical practice needs to include an understanding of the patient's experience of illness and how the patient values different treatment effects, side effects, and risks. These principles evolved into the patient-centered view of medicine in the 1980s [58–60].

Patient-centered health care incorporates the patient's personal experience of illness, values, and preferences for being involved in decision making [61]. EBM has adopted the philosophy and principles of patient-centered care in a process called shared decision making [62]. In this model, the clinician and patient act in a partnership to consider the evidence and discuss the risks and benefits of different treatment options. After he or she explores the different treatment options, the patient is then encouraged to take as much responsibility as possible in making an informed choice. In this respect, EBM assumes that informed choices by patients that consider individual preferences outweigh the scientific evidence [63]. For example, a patient with psychotic depression may be informed that the scientific evidence supports the superior efficacy of electroconvulsive therapy (ECT) or the combination of an antipsychotic and an antidepressant over treatment consisting of an antidepressant alone. However, when the information on the relative risks and side effects associated with ECT and antipsychotic medication are carefully considered, the patient may prefer to begin treatment with the less effective alternative consisting of antidepressant monotherapy. According to the model of shared decision making, the clinician is a consultant to the patient, helping to provide information and to clarify choices in the context of their personal values and preferences. In this respect, both the clinician and the patient become consumers of the evidence in the process of EBM.

In summary, EBM is the use of the current best evidence, adapted by the experienced clinician to address the specific circumstances of the individual patient, incorporating the preferences and values of the patient in a process of shared decision making. Another systematic application of the scientific evidence to inform clinical practice pertains to identifying those clinical interventions and services that are proven to be effective, defined as evidence-based practices or EBPs.

What are evidence-based practices?

Although it is generally accepted that the scientific evidence can be conceptualized along a hierarchy, the precise criteria or cut-off point used to define a given mental health intervention as “evidence-based” have been subjected to considerable discussion and debate. For example, the American Psychological Association defines a treatment as evidence-based when sufficiently rigorous evidence of efficacy exists, consisting of at least two RCTs or 10 single-case experimental studies with patients fitting diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders, revised

Fourth Edition, using interventions that are administered according to treatment manuals [53,54].

An alternative approach to defining evidence-based practices is exemplified by the National Registry of Evidence-based Programs and Practices (NREPP) (www.modelprograms.samhsa.gov). In this schema, quantitative ratings are applied to different components of the evidence base to develop rating scores that define the level of evidence for specific treatments and services. The NREPP process consists of ratings of 16 domains to obtain an overall rating that establishes specific practices as promising, effective, or model programs. Whereas the criteria for an effective program consists of an intervention supported by well designed, replicated studies, a model program meets these criteria for effectiveness and is also accompanied by step-by-step manuals to guide practitioners in implementing the intervention. Although the NREPP process holds promise as a resource for clinicians, NREPP is focused largely on evaluating models of care and service interventions (rather than discrete treatments) and has had very limited application to geriatrics.

Other systematic efforts to identify mental health EBPs using standardized and transparent criteria are in early stages. Teams assembled to review and synthesize the evidence for mental health interventions include the American Psychological Association [54], the Cochrane Collaborative [64], the British Medical Journal Publishing Group [65], Evidence-based Mental Health [66], the Schizophrenia Patient Outcome Research Team [67], the Texas Medication Algorithm Project [68], and the National Evidence-based Practices Project [69]. To date, none of these efforts has focused specifically on mental health interventions for older adults, and they have a limited direct application to geriatrics. Nonetheless, the principles embedded in these approaches can inform future initiatives to identify mental health EBPs for older adults. Regardless of the specific criteria used, the principles underlying these approaches to classifying EBPs reflect Cochrane's assertion made several decades ago that limited health care resources should be prioritized for interventions with proven effectiveness, based on well-designed studies that emphasize randomized clinical trials [70].

Evidence-based practices in geriatric mental health

To date, the present authors are unaware of any ongoing, comprehensive, and systematic efforts dedicated specifically to reviewing and defining evidence-based geriatric mental health interventions. An early approximation is provided by a recent survey of the available literature of meta-analyses and systematic evidence-based reviews of geriatric mental health interventions and services [44]. In this review of geriatric mental health evidence-based practices, 11 evidence-based reviews and 37 meta-analyses evaluating the effectiveness of pharmacologic and nonpharmacologic interventions for mental disorders in older adults were identified. Not surprisingly, this

summary found the greatest support based on multiple studies of pharmacologic and nonpharmacologic interventions for dementia and major depression. In contrast, few systematic reviews exist for treatments of geriatric alcohol use disorders and anxiety disorders, and no meta-analyses or evidence-base reviews were found for geriatric bipolar disorder or for geriatric schizophrenia. These published systematic reviews can be helpful in defining the published literature when there are adequate numbers of studies to support a meta-analysis or aggregate systematic review, but they are less helpful for treatments in which only a small number of studies have been conducted. The systematic reviews in this issue of *Psychiatric Clinics of North America* take the next step in describing the evidence base for geriatric mental health interventions across a spectrum of disorders and service models.

Practicing as an evidence-based clinician

Despite a rapidly growing body of research describing empirically supported treatments, the typical busy clinician rarely has the time to keep up with the constant stream of newly published research findings. However, a revolution in information technology in the field of medicine is changing the landscape of education and practice. Whereas conventional medical knowledge relied on outdated general knowledge gained from textbooks and augmented by selective skimming of the content of favorite journals, the contemporary clinician relies on immediate electronic access to the most current information on specific clinical questions. The skills for accessing these sources of data are now a common component of undergraduate medical education, but they are also available to the clinician in practical summaries. For example, practical guide books by Guyatt and Rennie [44] and Strauss and colleagues [71] provide excellent step-by-step manuals with detailed instruction on using and appraising the evidence base, conducting web-based searches, and locating and evaluating individual research studies.

The core elements of locating the best available information consist of first “asking an answerable question,” and then using the most efficient approach to locate the answer [71]. Formulating a focused question that is most likely to yield an answer is an acquired skill, but it can be guided by structuring the inquiry around four components, patient or problem, intervention, comparison, and outcome, which are summarized by the acronym PICO [72]. The PICO question first identifies the specific patient population or problem. The next step clearly designates the intervention (or exposure) of interest and the alternative choice or comparison (if relevant). Finally the specific outcome should be identified. Once this clinical question has been articulated, then a focused search for the answer can be conducted [71].

A practical approach to evaluating the evidence is to first consult electronic databases consisting of systematic reviews conducted previously. For example, reports from the Cochrane Collaboration, Evidence-Based

Mental Health, or Best Evidence provide summaries and evaluations of the published evidence for well-specified clinical questions [44]. An alternative approach is to specify searches in PubMed or MEDLINE to first identify any available meta-analyses that might have been conducted [73]. Finally, if a previously conducted systematic review is not available, a direct search of the primary research literature can be conducted. First searching through the use of the “Clinical Queries” search engine in PubMed allows for the focused identification of published RCTs, before expanding the search to include studies that are lower in the hierarchy of evidence, such as open-label, case-control, or naturalistic outcome studies [74]. Tips for improving the quality of PubMed or MEDLINE searches are available in a number of recent publications [43–45,75,76].

Limitations and caveats in applying EBM and EBPs to geriatric psychiatry and geriatric mental health services

The recent recommendations by the President’s Commission on Mental Health highlight the implementation of evidence-based practices as the keystone for improving the quality of mental health services in America [3]. However, a number of limitations and caveats are important to acknowledge in the context of recommendations for broad-based adoption of EBM and EBPs (Box 2).

Adequacy of the scientific evidence

One source of tension in the field of evidence-based psychiatry is the extent to which there is empirically based data available to inform specific clinical situations and problems. Despite significant progress in the field of geriatric psychiatry, there are substantial areas that lack extensive data to guide clinical decision making. For example, gaps in the treatment literature include a lack of studies ranging from pharmacologic treatment of late-life bipolar disorder and geriatric anxiety disorders to the effectiveness of psychosocial rehabilitation in older adults with schizophrenia. Although the highest level of evidence for a particular intervention is considered to be findings from meta-analyses, systematic evidence-based reviews, or

Box 2. Limitations and caveats

1. Adequacy of the scientific evidence
2. Limits of data based on conventional RCTs
3. Individualizing the evidence
4. Selection and definition of EBPs
5. Limits of pooled data and meta-analyses
6. Potential bias in reporting the evidence by researchers

replicated randomized controlled trials [46], it is important to recognize that evidence-based medicine is based on using the best *available* evidence in directing the decision-making processes. In areas in which the amount and quality of research varies widely for different disorders, the range of sources of evidence should be considered.

Despite these limitations, it is also the case that the field of geriatric psychiatry and mental health research has developed rapidly over the last decade to support large numbers of studies, especially for common disorders such as depression and cognitive impairment disorders. An up-to-date indication of the remarkable growth of the clinical evidence base is reflected in the impressive array of studies and content areas systematically reviewed in articles included in this issue of *Psychiatric Clinics of North America* on evidence-based geriatric psychiatry.

Limits of data based on conventional randomized controlled trials

The double-blind RCT constitutes a gold standard as an optimal method for objectively establishing the scientific evidence of treatment efficacy. However, this approach also contains some inherent limitations when it is applied to the clinical practice of geriatric psychiatry. First, efficacy trials are designed generally to emphasize internal validity by limiting potential experimental confounding factors and imprecision that might be caused by variations in the treatment population, treatment setting, or providers of the intervention. Although this approach is often necessary to establish the efficacy of an intervention, it may present problems in interpreting the generalizability of the findings or effectiveness when applied to heterogeneous populations, usual care treatment settings, and routine providers. This is a concern especially in the field of geriatrics, in which comorbidity and variation in health status and functioning are the rule rather than the exception. Similarly, older adults with mental health needs are most likely to receive or accept mental health services in busy primary care settings [15]. It is not always clear how findings from studies conducted in controlled experimental settings such as academic research centers apply to these settings, where relatively few studies of treatment effectiveness have been conducted. These settings also vary with respect to provider expertise, training, and professional discipline, possibly limiting confidence that the same results may be found when an intervention is applied by nonexpert providers. For these reasons, there have been calls for a greater emphasis on effectiveness and health services research that use methods designed to maximize generalizability of findings to heterogeneous populations, settings, and providers. In many instances, these studies may preserve the advantages of randomization but emphasize usual care populations, settings, and providers using an approach that has been termed “practical clinical trials” (or PCTs) [77].

Conventional experimental designs may also be limited in informing complex clinical questions because of the nature of RCTs that compare

single interventions. In this respect, they are limited in complex situations such as determining the next best agent in a series of failed trials or in deciding on different combinations of therapies. The sheer number of possible sequences and combinations of available treatments for different clinical conditions makes it impossible to provide clinical recommendations based entirely on data from RCTs [78,79]. An alternative approach to address this gap uses standardized surveys and quantitative methods to derive expert consensus [80]. Although this approach inevitably carries many of the limitations of expert opinions that are not directly based on experimental evidence, advantages over conventional group consensus procedures include the use of blinded ratings and presentations of aggregate confidence intervals for each treatment recommendation. An example of this approach is provided by guidelines on the pharmacotherapy of geriatric depression by Alexopoulos and colleagues [81]. Using a nine-point rating of the appropriateness of different treatment choices, 100 experts were asked to rate different assessment scales, acute and maintenance treatment strategies, dosing and duration of treatment, strategies for managing treatment-resistant conditions, the use of combination therapy, and drug selection in the context of medical comorbidity. Aggregate analyses were then conducted to determine the degree of consensus among the experts and to calculate confidence intervals for each treatment recommendation. As such, this approach represents an alternative for situations when empirically derived data are unavailable or not feasible.

Individualizing the evidence

Evidence alone is inadequate to guide treatment selections. As described previously in this overview, the proper application of EBM does not support or advocate the indiscriminate application of treatment protocols or the use of “cookbook” medicine. Data from empirical trials need first to be interpreted or adjusted in the context of a competent clinical assessment of the unique circumstances, clinical presentation, risk factors, and needs of the individual patient. Although data-based adjustments of anticipated risks and expected outcomes can often be individualized to specific patients for well-studied medical interventions [71], comparable approaches are relatively weak in the field of mental health. However, the clinician can still use clinical knowledge of the individual patient to interpret and apply findings from research populations. For example, after a brief search of the most recent research literature, a clinician may locate a comprehensive meta-analysis, finding similar efficacy of first-generation and atypical antipsychotic medications in the treatment of psychosis. However, data from longitudinal observational studies demonstrate that the risks of tardive dyskinesia are significantly greater for older persons, women, and for those who have many years of exposure to first-generation antipsychotic medications [82]. These factors would be important information in considering treatment

recommendations for a 75-year-old woman who has a psychotic relapse and who has a history of extensive exposure to antipsychotic medications. In another example, a clinician may locate a study reporting similar efficacy of an antidepressant that can be administered once per week, compared with an alternative agent requiring daily dosing. This would be important information in treating a depressed, cognitively impaired older person who lives alone but receives weekly visits from a home care nurse.

An additional component of individualizing the evidence consists of incorporating patient values or preferences. This important element of EBM is elaborated in current models of shared decision making [83]. Although the research on shared decision making has developed substantially over the last decade, little is known about approaches that are optimized specifically to meet the needs of the older patient. It is likely that older adults vary considerably with respect to the extent that they prefer to rely on the physician's recommendation compared with weighing treatment options on their own. In addition, older persons with different degrees of cognitive impairment present challenges in evaluating decisional capacity and the ability to engage in an informed process of weighing the merits of different treatments. Further research is needed on approaches that support shared decision making specific to the older person with different degrees of functional ability, cognitive capacity, and personal preferences.

Selection and definition of mental health EBPs

The Institute on Medicine report "Crossing the Quality Chasm" [1] and the more recent recommendations of the Present's Commission on Mental Health [3,4] have stimulated broad-based calls for the dissemination and implementation of EBPs in health care. Policy makers and payers have joined in this call to action, reflecting Cochrane's early admonition that limited health care dollars should be prioritized for treatments with proven effectiveness [70]. Many states and mental health care provider organizations are engaged in processes to identify specific EBPs for targeted implementation and dedicated resource allocation. This movement is exemplified by a recent law passed by the state of Oregon that mandates 75% of state-supported mental health services be required to consist of EBPs by the year 2009 [84,85].

In the midst of these initiatives, consumers have voiced concerns regarding the application of an evidence-based approach to the field of mental health. Among the many issues voiced by consumers is the lack of research conducted on mental health service alternatives (eg, peer support and other recovery-based services), which is perceived as a reflection of a research agenda driven by the scientific research community rather than consumers' needs and preferences [86]. At the center of this critique is the concern that valued services will not be reimbursed because the research community has not selected these services for study in a randomized clinical trial or because

certain interventions may not be amenable to a test of effectiveness by an RCT.

Expressing a related concern, some health policy researchers object that decisions identifying specific treatments for priority funding should not rely on findings derived primarily from RCTs. For example, Tanenbaum [87] notes that current workgroups formulated to identify specific lists of evidence-based mental health practices tend to use RCTs as the gold standard, yet they fail to differentiate between treatments that lack evidence because of a finding of ineffectiveness, versus those that lack evidence because they have not been studied. Additional concerns include the position that some forms of psychotherapy and socially complex services are ill suited to RCT research designs, that sound clinical practice is not necessarily consistent with the direct implementation of findings from science, and that different definitions of effectiveness are being used, sometimes in the service of minimizing expenditures or cost effectiveness [87]. These concerns and caveats regarding EBPs challenge researchers and policy makers to engage in an informed dialogue on the appropriate use, interpretation, application, and definition of scientific evidence in relation to health policy. The need for these discussions may be especially important for the field of geriatrics because of the common use of multicomponent interventions and the complex challenge of evaluating treatment outcomes for chronic and degenerative disorders.

Limits of pooled data and meta-analyses

Although there are significant advantages to seeking meta-analyses as a source for evaluating the level of evidence to support the efficacy or safety of a given intervention, there are inherent limitations that need to be considered in interpreting results based on pooled data. These approaches can be overly conservative in excluding informative studies, or, alternatively, they may cluster studies with inadequate attention to major differences. For example, common problems associated with conclusions about the aggregate efficacy or safety of a given intervention from different studies include small sample sizes and lack of power, heterogeneity of study subjects and methods, lack of interchangeable measures and outcomes, and differences in the quality and duration of studies [88,89]. Hence, there may be instances in which data from a single, large, well-designed RCT may be more valid than pooled analyses from a large number of different smaller studies with varying methods and outcomes.

An additional limitation to relying on aggregate analyses of published reports pertains to the problem of unpublished data. This issue is recently of particular relevance to the field of geriatric psychiatry in relation to recent reports on the safety of atypical antipsychotics in the treatment of dementia. An increased risk of cerebrovascular accidents and mortality associated with atypical antipsychotics in the treatment of patients with Alzheimer's dementia was only recognized after years of prescribing atypical antipsychotics in

the context of initially favorable reports on the safety and effectiveness of these agents in geriatric patients. After aggregating unpublished data from a number of different industry-supported clinical trials, 15 of 17 placebo-controlled studies of olanzapine, risperidone, quetiapine, and risperidone showed increases in mortality, compared with placebo, for older adults with behavioral disorders of dementia. Together, these studies involved 5106 patients and identified mortality rates of 4.5% among those receiving atypical antipsychotics, compared with 2.6% among those receiving placebo. Overall, aggregate analyses demonstrated a 1.6- to 1.7-fold increase in mortality, most commonly because of cardiovascular events, sudden death, or infections [90,91]. In this respect, it is important to consider if the available data are comprehensive and fully representative or comprise a select subset of results. The implementation of a new policy requiring the registration of all clinical trials as a prerequisite to being eligible for publication may help to reduce the likelihood that only selected data are being released for publication [92].

Potential bias in the report of the evidence by researchers

Approximately 70% of the funding for clinical drug trials conducted in the United States is procured from industry [93]. In addition to the possibility of bias in study designs and selective reporting of findings, contractual agreements with academic investigators may include provisions to control publication of findings or ensure that scientific reports occur in publications sponsored by industry with minimal input by the academic investigator [93]. Lucrative honoraria and gifts from industry have also been implicated in influencing attitudes and behaviors of investigators [94,95]. In addition to potential bias in the reporting of individual research studies, caution is warranted in relying on reviews of the literature in expert consensus guidelines. Conventional expert consensus guidelines are often assembled under the sponsorship of professional organizations that are invested in promoting specific treatment modalities. Of particular concern, expert panels developing treatment guidelines are composed largely of participants who have a relationship with industry. For example, review of 44 clinical guidelines for medical disorders published between 1991 and 1999 found that 87% of the authors had a financial relationship to at least one pharmaceutical company, although 42 of the 44 guidelines did not specify the existence of potential conflicts of interest [95].

Summary

Despite various limitations and caveats in the application of an evidence-based approach to the practice and delivery of geriatric psychiatry, the future of EBM holds tremendous promise for improving the quality and effectiveness of services provided by practitioners. Effective training of

clinicians in evidence-based practices will be an essential component of mainstreaming these practices into usual care and enhancing the quality of mental health services for older adults. In translating an evidence-based approach into daily practice, clinicians will need to develop the skills to quickly access and communicate findings on treatment outcomes, while also tailoring these findings to the unique clinical situation. Finally, clinicians will need to increase their familiarity and comfort with the process of shared decisions that actively incorporates the preferences and values of individual patients. In using an evidence-based approach to improve systems of care, scientific evidence will need to be synthesized in a transparent, standardized manner so that health care organizations and systems ensure that effective practices are provided and supported. In this respect, the principles of EBM should inform implementation of EBPs and the policies for creating evidence-based health care systems.

The field of geriatric psychiatry is in the early stages of embracing EBM, mostly through the promotion of selected EBPs. As evidenced by this issue, the field is beginning to synthesize evidence in the form of systematic reviews and evidence-based treatment recommendations. Procedures and workgroups are underway to identify core evidence-based practices for widespread implementation. However, the field of geriatric psychiatry is challenged by a variety of issues and inherent limitations that complicate the application of an evidence-based approach in daily clinical practice. Although great strides have been made in developing the evidence base for effective treatments of a wide spectrum of geriatric mental disorders, we are still hampered by a lack of knowledge on the best approach to implementing these practices and the supporting principles of EBM in routine practice settings. In particular, the field of geriatric psychiatry lacks adequate information needed to individually adapt findings on outcomes and risks from research studies to individual patients with different degrees of medical comorbidity, functional abilities, and cognitive capacities. Other significant challenges include how to best engage in the process of shared decision making in the context of varying levels of cognitive capacity and decision-making preference. Finally, there is an urgent need to develop effective approaches to train practitioners in the necessary skills to practice EBM and to change systems of care to effectively implement and deliver evidence-based practices.

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