

Principles for Training in Evidence-Based Psychology: Recommendations for the Graduate Curricula in Clinical Psychology¹

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We argue that the evidence-based practice (EBP) model represents an evolution in integrating science and practice and synchronizes well with broader trends in health care. Because the curriculum for EBP training involves explicit emphasis on the best empirical evidence within Clinical Psychology, it can be utilized by all programs, irrespective of theoretical orientation or training mission. We articulate four principles that speak to core training and foundational clinical supervision, to guide training using an EBP model. These principles can be integrated within the larger rubric of a program and can encourage more consistent curricular reliance on EBP. This approach to doctoral training could lead to greater consistency across training programs and bring science and practice closer together within Clinical Psychology.

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In 1947, the American Psychological Association first accepted as policy the requirement that a Clinical Psychologist should be trained both as a scientist and as a professional (Shakow et al., 1947). Although this policy appeared simple at the time, Clinical Psychology as a field has struggled over the decades with how best to blend these two facets in doctoral training. In this article, we will describe principles that we believe address key components of foundational training in Clinical Psychology and facilitate the integration of science and practice. We develop the context for these principles by offering a brief review of the history of training models in Clinical Psychology, ending with a discussion of evidence-based practice (EBP) models that have evolved within psychology (American Psychological Association [APA], 2005), medicine (Sackett, 1969; Sackett, Haynes, Guyatt, & Tugwell, 1991; Sackett, Haynes, & Tugwell, 1985; Straus, Glasziou, Richardson, & Haynes, 2011), and associated healthcare professions (e.g., Craig & Smyth, 2002). Although providing healthcare services using an EBP approach is similar across professions, integrating training in EBP must, by necessity, be modified for each field, given different emphases in training models used by these professions. The current principles are designed to accommodate foundational training as it is conducted

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in most every Clinical Psychology training program, regardless of theoretical orientation or training mission.

EVOLUTION OF THE SCIENTIST-PRACTITIONER MODEL

In the immediate aftermath of World War II, the Veterans Administration (VA) was in dire need of Clinical Psychologists, given the large number of returning soldiers with mental health problems (e.g., Routh, 1994). At the time, most psychology doctoral training programs were strictly academic, focusing on coursework and research. Although exceptions existed (e.g., the University of Pennsylvania), most graduate students arranged their own clinical practicum and participation in internship training was optional (Routh, 1994). With support from the VA and National Institute of Mental Health, the American Psychological Association formed the Committee on Training in Clinical Psychology, headed by David Shakow. In 1949, the Conference on Graduate Education in Clinical Psychology was held in Boulder, Colorado, endorsing the recommendations of Shakow and his committee concerning the integration of training in science and practice. The Boulder model (as it became known) thus became the standard training model for Clinical Psychology, with particular emphasis on including practicum experiences during graduate training, as well as requiring an approved internship year of clinical training.

Although recognized as a step toward integrating experiential clinical training with coursework, scientific training, and other forms of scholarship, it quickly became evident that the Boulder model did not necessarily provide a framework for how training in science and practice should be synthesized. Trainees complained that graduate faculty were apathetic about the quality and nature of practicum training and that recent graduates were more interested in practice than research (e.g., Levy, 1962). A series of meetings followed the Boulder conference, each designed to revisit this training model. Participants discussed the relative emphasis that should be given to research versus clinical training and whether Clinical Psychology doctoral programs should try to include both facets within their curricula. The split between science and practice seemed to widen over time, as highlighted by the establishment of doctoral programs that significantly

de-emphasized research training (Hayes, Barlow, & Nelson-Gray, 1999).

Alongside this context, changes in healthcare economics were occurring, which increasingly required the use of research-supported interventions in order for mental health services to be reimbursed. These pressures seemingly aggravated the widening divide between scientists and practitioners (see Hayes et al., 1999). Simultaneously, these changes forced graduate faculty to take a closer look at training in Clinical Psychology doctoral programs, as students became increasingly aware of the need to learn psychological treatments that had scientific support. For many, research became more obviously relevant, as it was linked to understanding psychopathology and developing effective assessment and treatment methods. Increasingly, junior Clinical Psychology faculty were hired whose research focused on the development and evaluation of treatment approaches for particular types of disorders. In this context, doctoral training in Clinical Psychology arrived at the doorstep of EBP.

EVIDENCE-BASED PRACTICE: IMPLICATIONS FOR TRAINING CLINICAL PSYCHOLOGISTS

The current emphasis on EBP began with efforts within Medicine (Sackett, 1969; Sackett et al., 1985, 1991) as well as efforts within Clinical Psychology (Chambless et al., 1996, 1998). Led by Guyatt, a working group of physicians at McMaster University (Evidence-Based Medicine Working Group, 1992) coined the term “evidence-based practice” and defined it as “the integration of best research evidence with clinical expertise and patient values” (Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000, p. 1). In 2005, the American Psychological Association endorsed an EBP model, stating that its purpose “is to promote effective psychological practice and enhance public health by applying empirically supported principles of psychological assessment, case formulation, therapeutic relationship, and intervention” (APA, 2005, p. 1; APA Presidential Task Force on Evidence-Based Practice, 2006). As noted in the larger policy, the APA definition is specific about how to operationalize research evidence but understandably ambiguous with respect to the nature and operationalization of clinical expertise and patient values. As well, the policy lacks information about how and when

clinical expertise and patient values should be integrated with research. The ambiguity is not a deficit of the APA policy so much as an accurate reflection of the state of knowledge in the field.

Within Clinical Psychology, the Society of Clinical Psychology under the leadership of Nate Perry, David Barlow, and Susan Mineka began a dialogue about empirically validated psychological treatments around the same time as Guyatt's group began their efforts. This dialogue eventuated into a task force report led by Dianne Chambless (Task Force on Promotion & Dissemination of Psychological Procedures, 1995) that outlined specific criteria needed to label a specific treatment as empirically validated. These criteria were based on the number and methodological quality of published studies, features which continued to be debated in the literature for years following the task force publication. Moreover, the task force report included discussion of training in empirically validated treatments during both predoctoral and internship experiences. Thus, some of the concepts outlined in the current article were originally mentioned in the 1995 task force report, adopted by the Society of Clinical Psychology.

Drawing from these two origins, the EBP model has notable implications for doctoral training in Clinical Psychology. As articulated by many authors (e.g., Collins, Leffingwell, & Belar, 2007; Spring, 2007), the curriculum for evidence-based training revolves around the conscientious and explicit emphasis on the best current evidence within Clinical Psychology. The evidence is the outcome of well-designed research studies in the field of psychology. The terms "evidence-based training" and "evidence-based practice" do not indicate one specific instructional approach or one specific technique and do not favor one theoretical orientation over another. Often mistaken as the same, evidence-based practice and evidence-based training differ from manualized, empirically supported treatments (ESTs) in that it is not simply a list of treatments that have demonstrated empirical support. Rather, evidence-based training is a general training approach designed to ensure that doctoral students become proficient in the skills, knowledge, and behavior necessary for the study and practice of Clinical Psychology (Hoge, Tondora, & Stuart, 2003; Spring, 2007).

INCORPORATING EBP INTO THE CORE CURRICULUM IN CLINICAL PSYCHOLOGY

In an era of increasing specialization, it is salient that a number of groups are developing training guidelines for various forms of specialty training in Clinical Psychology [e.g., training for clinical scientists (e.g., McFall, 2012), training for behavioral health practitioners (Masters, France, & Thorn, 2009)]. Each of these specialty training models rests on the assumption that doctoral students will receive foundational training in core areas (e.g., psychopathology, evidence-based assessment, evidence-based treatment) and will receive supervision in the development of core clinical skills (e.g., case formulation, differential diagnosis, conceptualization and implementation of technical and relational interventions, ethics, sociocultural competence). Although these may be self-evident goals for doctoral programs, a recent cross-sectional poll of training programs in Clinical Psychology revealed that 44% of Ph.D. programs and 67% of Psy.D. programs did not require both didactic training and clinical supervision in evidence-based therapies (Weissman et al., 2006). As such, the gulf between what Clinical Psychology training programs need to do and what they are actually doing is considerable. Recognizing the centrality of evidence-based training, in this article, we will present cross-cutting principles that can guide Clinical Psychology doctoral programs of all forms in the incorporation of evidence-based models of training.

In developing these key principles, the authors combed the recent literature on evidence-based practice and training models across disciplines that reflect this approach (e.g., Bauer, 2007; Collins et al., 2007; Gray, 2004; Hunsley & Mash, 2007; Spring, 2007; Straus et al., 2011; Thorn, 2007; Youngstrom, 2013). Moreover, in drafting these principles, the authors recognize that multiple epistemologies can be useful in undergirding training programs. Within the principles presented here, emphasis is placed on logical positivism (also known as logical empiricism). The authors believe that the phrase "evidence-based" should refer to empirically grounded information (including but not restricted to ESTs) and should subsume both quantitative and qualitative sources of data. Although we regard clinical expertise and patient values as essential elements in training students to conduct assessment, case

formulation, treatment, and larger-scale clinical interventions, these perspectives at present are not well grounded in scientific data. As the field evolves further and there is greater empirical knowledge about clinical expertise and patient values, including models for how to integrate research with these two other domains, these components can be incorporated more fully into systematic training efforts.

The intent of this article is to present specific principles to guide the core doctoral training and foundational clinical supervisory experiences for Clinical Psychology programs, irrespective of the theoretical orientation of the faculty or the training mission of the program.² In many respects, evidence-based training has the potential to unify Clinical Psychology, if doctoral students are trained with similar expectations regarding how to synthesize multiple sources of information. The principles provided here represent one step toward this goal.

KEY PRINCIPLES OF EVIDENCE-BASED DOCTORAL TRAINING

Principle One: Teach Students to Base Clinical Practice on Research

Integration of Assessment and Treatment. Accurate assessment of a client allows a psychologist to determine which parts of the research literature are most applicable to the individual. Assessment is clinically relevant when it addresses one of the three P's of *prediction, prescription, and process* (Youngstrom, 2008). Included in recommended instruction is training on psychometrics, the reliability and validity of measures, learning how to select the best validated measures for each clinical purpose and for the given population, and helping students to integrate findings from different sources of assessment, particularly when obtained findings appear discrepant (e.g., De Los Reyes & Kazdin, 2005). Preference should be given to assessment methods that have demonstrated validity (Bossuyt et al., 2003), recognizing that continued use of assessment methods that lack demonstrated validity always adds cost and may result in less valid clinical decisions or even harm (Kraemer, 1992). An important consideration is whether the assessment method has been validated for the particular sociocultural group or in the language that it is being used (e.g., Bonilla, Bernal, Santos, & Santos, 2004; Jaeschke, Guyatt, & Sackett, 1994b). This also is important in considering the client's

values and preferences when negotiating decisions about assessment or treatment options (Barratt, 2008).

Assessment and treatment ideally are tightly integrated, with assessment guiding clinical decisions about case formulation and treatment conceptualization. Decisions about where to focus training should start with the most common presenting problems, and then look to the commonly used measures addressing these domains (Camara, Nathan, & Puente, 1998), with critical evaluation of any new data about alternate measures that might have greater validity for a particular purpose or group (defined by demography, cultural, or clinical factors). Advances in technology make it possible to integrate methods that focus on individual posterior probabilities based on key clinical variables. Training should aim for sufficient "numeracy" (Gigerenzer & Hoffrage, 1995) and competence with concepts and interpretation, so that doctoral students can use these methods appropriately in providing care, even if not all programs emphasize the statistical underpinnings of these approaches. For example, it would be helpful for graduates to understand the differences among sensitivity, specificity, and positive and negative predictive power of a test and the nature of the implications drawn from each of these indices regarding a test's diagnostic utility and application, factoring in consideration of developmental and cultural factors (e.g., Grove, Zald, Lebow, Snitz, & Nelson, 2000; McFall & Treat, 1999). It is possible that research-oriented programs are more likely to teach this content (and other methods) as part of the curricula so that students learn how to generate these results as well as evaluate them. However, irrespective of the program's emphasis, students should be introduced to these basic concepts with emphasis on the integration of assessment and treatment in clinical practice.

Data-Based Practice. Students should be taught to administer ongoing assessment throughout treatment to evaluate the effects of treatment on the individual client (Powsner & Tufte, 1994), to make data-based decisions about modifying or terminating treatment taking into account client response (Lambert, Hansen, & Finch, 2001), and to consider not only symptom presentation but also level of functional impairment and quality of life when making these decisions (Frisch,

1998). A salient component of data collection is assessment of the client's preferences for treatment, including issues such as available economic resources, preferred mode of treatment (e.g., individual, family, or group therapy), and culturally driven considerations, as these will guide treatment planning and influence individual responses to specific interventions (Kraemer, 1992; Swift, Callahan, & Vollmer, 2011). Ideally, students could also have exposure to program evaluation, as a way of thinking about patterns and outcomes at a clinic level or system level, in addition to individual patient-level outcomes (Castonguay, Barkham, Lutz, & McAlavey, 2013).

Therapy Training Recommendations. Therapy training should emphasize grounding in the empirical literature on three facets: (a) client and therapist characteristics, (b) process variables, and (c) treatment outcome. For each domain, students should be exposed to findings that cut across theoretical orientations as well as those that are unique to particular approaches. Exposure to findings that demonstrate the impact of sociocultural, demographic, developmental, and other contextual factors on clinical practice is needed (e.g., Bohart & Greaves Wade, 2013). Readings and coursework should cover both positive and negative effects associated with each of these three research facets. Training of students should focus not only on what to do in order to facilitate client improvement but also on how to prevent harmful effects (e.g., Lilienfeld, 2007), in line with ethical principles in Clinical Psychology.

Client and therapist characteristics refer to factors that are independent of any specific treatment approach. Some of these variables have been found to predict the outcome of different forms of therapy, such as client's high level of perfectionism (e.g., Blatt, Quinlan, Pilkonis, & Shea, 1995). Other pretreatment characteristics, such as reactance level (i.e., the tendency of a person to oppose being controlled by others), might be considered as markers for matching individual clients with particular forms of therapy or therapeutic styles (Norcross, 2011). Sociocultural and demographic client factors may also have an impact on the process and outcome of therapy (Pachankis & Goldfried, 2004; Sue & Zane, 2009), including the client's age, gender, country of origin, socioeconomic status, ethnicity,

religion, language, sexual orientation, and sexual identity. Beyond cultural knowledge and culturally adapted treatment strategies and processes (e.g., Bernal & Domenech Rodríguez, 2012; Hays & Iwamasa, 2006), therapists should also be trained to consider within-group heterogeneity and to refrain from presupposing a client's sociocultural values even if seemingly appropriate (Sue & Zane, 2009). Students should also learn about research on therapist effects (Baldwin & Imel, 2013), as well as the evidence pointing to therapist characteristics that may facilitate or interfere with the process and/or outcome of therapy (e.g., attachment style or hostility toward self; see Castonguay, Boswell, Constantino, Goldfried, & Hill, 2010).

Process variables refer to factors that take place during treatment and that can predict or explain therapeutic change. Participant characteristics such as the therapist's empathy and the working alliance are positively related to change in several theoretical approaches to therapy (Norcross, 2011). Similarly, a number of therapeutic events (e.g., increased client awareness) have been found to be helpful by both client and therapist (Castonguay et al., 2010). The process literature also indicates that helping skills (e.g., reflection of feelings) are useful in training students to conduct therapy (e.g., Hill, Stahl, & Roffman, 2007). Process research has identified variables that are predictive of outcome in particular forms of therapy, such as the use of homework in cognitive behavioral therapy (CBT), accurate interpretations in psychodynamic therapy, and the deepening of emotion in humanistic therapy (see Castonguay, 2013). Reframing interventions (e.g., changing the client's view of his or her presenting problem from an individual to an interpersonal perspective) has also been linked to the process of change in systemic therapy (Castonguay, 2013). In training students about therapeutic process variables, it is important to emphasize the research base on these ingredients of therapy, free from specific theoretical orientations. For example, the fostering of emotional experiencing (emphasized in humanistic therapy) and the focus on the past (central to psychodynamic treatment) also are associated with positive therapeutic outcome in CBT (Castonguay, 2013). Some techniques are process variables not tied to a single intervention model (Davis, Lebow, & Sprenkle, 2012), and others are common factors that

are teachable and associated with promoting better outcomes (Wampold, 2001). As such, we believe that teaching the evidence base on process variables in therapy is an essential component of training in EBP.

Of equal importance, students should learn about studies investigating the efficacy and effectiveness of specific treatments and thus be familiar with the *treatment outcome* literature. As a result of numerous empirical investigations and systematic application of evidence-based criteria to outcome studies, a number of ESTs have been identified (see Chambless & Ollendick, 2001). These evidence-based criteria (e.g., random assignment to treatment conditions, adequate statistical power to detect meaningful differences between treatment and comparison conditions, independent evaluation of outcomes by raters unaware of treatment condition; Chambless & Hollon, 1998; Silverman & Hinshaw, 2008) evaluate aspects of study design and research methodology that increase confidence in conclusions that are drawn about the efficacy of an intervention. When available for a condition or problem, ESTs should be taught early and used preferentially. The preferential use of treatment approaches supported by empirical evidence rests on the assumption that treatments with the best available research have the greatest chance of leading to clinical improvement and potential recovery. ESTs are available for numerous treatment modalities, including individual, group, couples, and family therapy formats.

When considering ESTs, some researchers have conducted trials to examine whether clients from different racial/ethnic groups respond differentially to empirically supported treatments while others have focused on making cultural adaptations to ESTs (e.g., Bernal & Domenech Rodríguez, 2012; Hays & Iwama, 2006). The limited existing studies suggest that treatments are effective when applied to ethnically diverse populations, especially when they are adapted to meet the needs of the specific group (e.g., Aguilera, Garza, & Munoz, 2010; Comas-Díaz, 1981; Ono et al., 2011). At the same time, several researchers have found that cultural adaptations to ESTs result in enhanced treatment outcomes (Benish, Quintana, & Wampold, 2011; Griner & Smith, 2006; van Loon, van Schaik, Dekker, & Beekman, 2013). Of course, in some cases such cultural adaptations may not be

available or applicable, and it will be important that empirical research continues to illuminate their role within EBP (Huey & Polo, 2008). A key aspect of training is to teach students to consult the literature to determine when adaptations are needed for particular subgroups rather than relying on assumptions about the need to modify ESTs. For example, contrary to popular belief, findings from the child treatment literature suggest that ethnic minority status does not moderate treatment effects (Huey & Polo, 2008). Studies that compare culturally adapted and standard ESTs are still needed for many different sociocultural groups to more fully evaluate the need for specific treatment adaptations, ideally using a noninferiority or equivalence design (Wellek, 2002). Although the field still awaits controlled trials for many diverse groups (e.g., lesbian-gay-bisexual [LGB]-affirmative approaches), students in the meantime should be trained to draw on the extant empirical work (e.g., combining LGB-specific empirical findings with existing ESTs) in order to improve treatment of these groups, until results from such studies are forthcoming (Pachankis, 2009).

Fortunately, ESTs are not restricted to one theoretical orientation. As an example, the literature on treatment of depression notes that cognitive, behavioral, interpersonal, psychodynamic, and experiential treatments have been identified as empirically tested (Follette & Greenberg, 2006). Students should also be exposed to forms of therapy that have not yet been identified as EST but have showed positive, albeit preliminary, results (e.g., integrative therapy for generalized anxiety disorder; Newman et al., 2011).

Training should include teaching doctoral students how to access information regarding evidence-based treatments from trusted sources as well as how to proceed in the absence of established treatments (Straus et al., 2011). Training should also include information about potentially harmful treatments (e.g., group treatment for conduct disorder, critical incident stress debriefing for posttrauma survivors; Lilienfeld, 2007). In addition to receiving training in assessment and treatment models that have received empirical support, students should learn about patient-focused research, which is designed not to measure more generally the impact of a treatment but to assess and improve the progress of individual clients or the pattern of change

of specific groups of clients. This facet of the outcome literature includes studies demonstrating the effect of therapy “dose” on outcome, examination of phases of therapeutic improvement, and empirical consideration of the beneficial impact of therapist feedback³ (e.g., Howard, Lueger, Maling, & Martinovich, 1993; Lambert et al., 2001). Patient-focused research is part of a larger body of empirical studies that have been conducted in naturalistic settings and with the active participation of clinicians, termed “practice-oriented research” (Castonguay et al., 2013). This approach should be presented to students as equipoise and complementary to studies conducted in controlled environments, with both types of research being viewed as necessary in building a robust knowledge base and improving clinical practice (Barkham & Margison, 2007; Barkham, Stiles, Lambert, & Mellor-Clark, 2010).

The Role of the Supervisor. These recommendations change the traditional role of the supervisor. In addition to the conventional aspects of supervision, the proposed recommendations entail more guidance about searching the research literature, critically appraising findings in terms of validity and relevance to the specific client (including taking into account the client’s sociocultural and demographic context), and applying the findings to the case at hand (Straus et al., 2011). There is also value in having clinical supervisors model the skills of search and application and “thinking aloud” about this process with supervisees. The authors also advocate adopting a patient-centered approach to learning that has been well developed in Evidence-Based Medicine (EBM; Hoge et al., 2003; Straus et al., 2011).

Research Training Recommendations. In their training, Clinical Psychology doctoral students should have enough knowledge of rigorous methods of both quantitative (e.g., randomized control trials, single-subject designs, process-outcome studies) and qualitative analyses (e.g., task analysis, consensual qualitative research, comprehensive process analyses) to become expert consumers of the research literature. Students should have enough foundational knowledge in research design and analysis to be able to evaluate the quality of the published research. Learning standard methods for critically

evaluating designs and publications [e.g., consolidated standards of reporting trials (CONSORT; Moher, Schulz, & Altman, 2001), standards for the reporting of diagnostic accuracy (STARD; Bossuyt et al., 2003)] can facilitate students’ understanding of research quality. Training in research methods should also include training in fundamentals of clinical research ethics, epidemiology, statistical analysis, and skills for comprehending systematic reviews and meta-analyses. Readings should include exposure to informatics and database searching skills. The inclusion of reading on clinical significance is particularly important in research training in Clinical Psychology (e.g., Kazdin, 1999). Model research training will include specification of the full diversity of methodologies that have been used to study psychopathology, assessment, prevention, and treatment (including efficacy, effectiveness, and practice-oriented studies), with articulation of the pros and cons of each design. Clinical research ethics are a crucial aspect of training to ensure the protection of human subjects, and that the well-being of research participants is not compromised in any way to enhance research design (e.g., through use of a no-treatment control condition for conditions that require immediate treatment or for conditions for which effective treatments have been identified; Hoagwood & Cavaleri, 2010). Like all other healthcare fields, Clinical Psychology prizes research that is ethical, replicable, generalizable, and, where possible, able to establish cause and effect. Clinical research training for evidence-based practice should reflect these values.

Principle Two: Teach Critical Thinking

“Know Thyself”—Understanding Biases. Students should be trained to understand and appreciate how heuristics and biases, particularly confirmation bias, will limit the accuracy of their judgments (Arkes, 1991; Garb, 1998). This information can assist students in learning how to recognize when their decisions are guided by biases, how to correct this, and how to use valid psychological measures to continually evaluate/double-check their clinical impressions (Croskerry, 2002, 2003; Meehl, 1954). Learning about one’s values, assumptions, and culture and critically reappraising one’s training and competencies are ongoing processes that can be woven through training and practice of

evidence-based methods (Hoge et al., 2003; Straus et al., 2011).

Students should learn to be critical consumers and producers of the research literature, recognizing common sources of bias in assessment (Bossuyt et al., 2003; Campbell & Fiske, 1959; Jaeschke, Guyatt, & Sackett, 1994a; Meehl, 1954) and treatment studies (Chambliss & Ollendick, 2001; Moher et al., 2001; Silverman, 1998), and both the strengths and limitations of different study designs for yielding knowledge that generalizes to clinically relevant and diverse populations. Students should be trained to be attuned to how ethical issues may operate in clinical research studies (e.g., selection of control groups, inclusion/exclusion criteria, informed consent; Hoagwood & Cavaleri, 2010). In addition, students should learn how biases and heuristics (including confirmation bias) can affect their perspective in research contexts, constrain the nature of hypotheses they consider, and affect their interpretation of both previous research and their own study data.

Clinician as Hypothesis Tester. Students should be trained and supervised in the application of scientific thinking to practice, in particular hypothesis testing, data collection, and Bayesian decision making, within a clinical context (Dixon et al., 2009; Lueger, 2002; Straus et al., 2011). To optimize the clinical benefits of such scientific thinking, we recommend that students be trained in all aspects of the evidence cycle: (a) development of searchable questions based on a client's presenting problem; (b) searching of the literature to find the highest quality evidence for their clinical question; (c) critical appraisal of the literature; and (d) understanding and applying the results of those studies to the care of their client. Optimally, this problem-focused approach should make use of data collected not only at pretreatment (intake and/or assessment sessions) but also during treatment and before termination. Specifically, and as mentioned in Principle 1, students should learn how to monitor progress to make sure that treatment is helping and not having unintended consequences (Lambert & Brown, 1996; Lambert et al., 2001; Powsner & Tufte, 1994). In addition to repeated assessment of outcome metrics, students should be encouraged to use process and session-impact measures

(see Hill & Lambert, 2004, for review), which can provide brief and reliable assessments of potentially effective but also hindering events taking place during sessions. Monitoring of both outcome and process of therapy should be viewed as a strategy for trainers to help students uphold the most important ethical principle of our field: "First do no harm" (Castonguay et al., 2010). When balancing the goals of research and practice, protection of human participants must take precedence above all else. Studies should be conducted in a manner such that the design provides confidence that a particular treatment approach results in benefit to the participant on unbiased assessments of functioning, even if these results are contrary to the original hypotheses. In clinical work, a student's loyalty to a given approach should not override evidence that this approach may not work for a given client.

Using Evidence-Based Principles of Change. Students should be trained in how to proceed clinically in the absence of highly relevant scientific knowledge (the "rigor versus relevance" dilemma, where clinical practice involves some individual cases that will not be well represented in rigorous research; Schon, 1983). Students should learn how to use guiding principles and generalizations from evidence to shape treatment conceptualization, rather than switching to unstructured, unreflective improvisation in the absence of strong evidence (Norcross, Hogan, & Koocher, 2008; Stricker & Gold, 1996). For example, exposure is a technique with empirical support for a wide range of anxiety and fear conditions. Even if a client's anxiety problems do not meet diagnostic criteria for a specific anxiety disorder with a corresponding EST, critical thinking about the scientific literature may lead a therapist to identify exposure as a research-informed treatment option (Woody & Ollendick, 2006). Although existing evidence-based interventions have been identified according to diagnostic categories, treatment need not be organized around a diagnosis, but should have a formulation that guides choice of strategies and which can be measured to show progress (Crits-Christoph, 1998; Luborsky, 1984; Sanderson & McGinn, 1997). These suggestions not only reflect the importance of using critical thinking in the conduct of psychotherapy but are also consistent with the

recommendation that clinicians be guided by empirically based principles of change to help them adapt or enhance the impact of ESTs for individual clients (Norcross et al., 2008; Spring, 2007; Stricker & Gold, 1996; Woody & Ollendick, 2006).

Principle Three: Teach Lifelong Learning

Learning How to Learn. Courses and other learning experiences should be organized not just in content but toward teaching students how to learn and how to continue to update their knowledge and skills throughout their careers to reflect continued progress in the field. In particular, students should develop an understanding of how to acquire and organize information, learn to keep abreast of new knowledge regarding evidence-based practice, and learn how to incorporate this new knowledge into their clinical practice. Students should develop the expectation and understanding that this skill is essential given the accelerating pace of information creation and dissemination in Clinical Psychology.

Understanding Patient Centeredness. Training should teach patient-centered approaches to framing questions, searching for, evaluating, and applying the evidence in real time using the evidence-based practice model, as elaborated by Sackett and proponents of EBM (Hoge et al., 2003; Howard, Allen-Meares, & Ruffolo, 2007; Sackett et al., 1991). Students should learn how to present risks and benefits of different treatment options in ways that are easily understood by the client and promote informed choice (Straus et al., 2011). It is also crucial to learn how to elicit client preferences and cultural beliefs, and be able to discuss and integrate these issues in shared decision making about treatment (Norcross et al., 2008).

Evaluating the Source of Evidence. Students should be familiar with go-to websites, high-quality journals, and published books that are trusted sources of information regarding EBP (Spring, 2007). Crucial skills to be effective consumers of Web-based information include critical appraisal of conflicts of interest, appraisal of the systematic review criteria and research designs utilized by the website to identify effective practices, as well as strategies for resolving disputes between competing claims about a tool or technique. The skills

recommended in Principles 1 and 2 will be particularly useful for students when evaluating the quality of information provided by various websites and journals, especially unvetted sources of information, such as Google, Wikipedia, and social media sites. In addition, supervisors and trainers should stay abreast of websites and journals that provide high-quality information and encourage their students to utilize them as part of ongoing, lifelong learning.

Principle Four: Integrate Experiential With Didactic Learning in All Aspects of Training

Provide Integrative Learning Opportunities. Inclusion of opportunities for experiential learning will facilitate the integration needed for students to gain skills with evidence-based practice (e.g., McGinn, Jervis, Wisnivesky, Keitz, & Wyer, 2008). Examples of high-quality experiential learning opportunities include:

- (1) Combining didactic lectures with adjunctive small-group interactive learning and individual supervision;
- (2) Reviewing case vignettes (e.g., Jenkins, Youngstrom, Washburn, & Youngstrom, 2011), watching videotapes of faculty members conducting assessment or therapy, working through the process of navigating ethical dilemmas (e.g., reporting potential child abuse, disclosing information about potentially harmful behavior to the parent of an adolescent), and watching faculty model the process of conducting research searches and critically evaluating the findings;
- (3) Training in health-information technology systems and active utilization of database resources for research and practice (Meats, Brassey, Henehan, & Glasziou, 2007), learning how to incorporate preappraised information, the development of critically appraised topics (CATs), or portfolios combining assessment or therapy materials with summaries of key strengths and limitations (Gilbert, Burls, & Glasziou, 2008); and
- (4) Encouraging active learning via student presentations, debates, written articles, journal club, ethical case vignettes, and collaborative work with peers on these projects, especially when

emphasizing clinical relevance (Straus et al., 2011). There are a variety of developed models for these types of educational activities in other healthcare disciplines that could readily be adapted for use in psychology training, including curated collections of critical reviews of published articles distilling the key features and clinical relevance (e.g., Gray, 2004; Hoge et al., 2003).

Supervisory Skills. Clinical supervision should be performed by supervisors who are well versed in evidence-based practice. Smaller programs with fewer faculty may face more challenges offering supervision by multiple faculty members familiar with various methods, relative to larger programs (Pagoto et al., 2007). Core faculty in Clinical Psychology doctoral programs often share responsibility for clinical supervision with local practitioners. Both approaches have their advantages, as core faculty may have finely honed, specific expertise, whereas practicing clinicians may facilitate exposure to a variety of clinical populations and techniques for their supervisees. Regardless of whether supervision is provided by core faculty members or practitioners, it is important to ensure that students receive clinical supervision from supervisors who are knowledgeable about and experienced in the application of evidence-based practices. A range of different training support methods, including online videos and continuing education programs, are developing as ways of augmenting local expertise and resources.⁴

In addition, clinical supervision should include live supervision, co-therapy, or watching videotapes of the students' therapy sessions, both during students' initial sessions and as they work on mastering specific intervention techniques. Rather than hearing the student's account of therapy, video-based supervision is important for observing the student assess client preferences, introduce therapy options with awareness of diversity issues, consider ethical issues relevant to clinical practice, and integrate relationship skills alongside empirically supported treatments.

Integrating These Principles Into Doctoral Training

In considering the incorporation of these principles into Clinical Psychology doctoral training, it is important to

recognize that these guidelines can and should be integrated into a program's existing coursework, practica, and milestone requirements. The authors have explicitly avoided providing reading lists, recommending particular course sequences, or putting forward curricular suggestions that might appear prescriptive. Currently, doctoral programs in Clinical Psychology vary widely with regard to theoretical orientation, training model/mission, and specialization, yet all share common elements of training (e.g., specific coursework on psychopathology, diagnosis, case conceptualization, therapy, and ethics; foundational courses in biological factors, cognitive and affective issues, developmental and social influences, and individual differences). We have constructed these principles of training in evidence-based practice so that they can be integrated within the larger rubric of a specific training program.

THE PATH AHEAD: EXCITING CHALLENGES FACE DOCTORAL TRAINING PROGRAMS IN CLINICAL PSYCHOLOGY

Although the field has evolved considerably since 1947, a number of new challenges face Clinical Psychology training programs. New pressures face the field, including strong calls for improved dissemination and a changing national healthcare system with the Patient Protection and Affordable Care Act (PPACA) that reduces disparities, focuses on prevention and wellness initiatives, and is projected to increase the demand for mental health services (e.g., Kazdin & Rabbit, 2013). Other provisions of the PPACA likely to impact both patients and providers include a focus on healthcare efficiency and measurement and tracking of healthcare outcomes. Evidence-based practice is at the core of Clinical Psychology's response to these challenges, and it is therefore imperative that doctoral programs in Clinical Psychology include training in EBP within their foundational coursework and practica.

As discussed, training doctoral students to conduct evidence-based practice requires coursework, clinical supervision, and research experiences that are synchronized so as to allow students to use an evidence-based approach to learning and to integrate aspects of evidence-based knowledge throughout all stages of training. An essential component is learning the requisite skills to search for new evidence, to evaluate it

critically, and to decide when to update or upgrade skills and content to provide optimal care for the individual client. Evidence-based practice bridges and integrates science and practice via the process of continually checking for clinically relevant research evidence that improves the care provided to the individual. In very many respects, EBP has the potential to unify science and practice, by training emerging Clinical Psychologists that each aspect of the field cannot thrive without the other.

NOTES

1. This article is the result of a Division 12 (Society of Clinical Psychology) task force, assembled by J. Gayle Beck, as a component of her presidential initiative during 2012. The opinions expressed in this document do not reflect any one individual's, but rather have been reached through discussion and consensus among the task force. Order of authorship is alphabetical, reflecting the equal participation of authors.

2. In designing these principles, we are focusing on Clinical Psychology, which is appropriate given our individual and collective training experiences. It is possible that some or all of the principles outlined in this document can apply to training in broader health services psychology, as recently discussed by the Health Service Psychology Education Collaborative (2013).

3. Feedback and recommendations related to a previous draft of this document were also sought and received from representatives of various APA divisions and other professional organizations to ensure the relevance of these principles to different types of Clinical Psychology training programs/models.

4. Interested readers may wish to examine a collection of readings that are available on the Society of Clinical Psychology website, <http://www.div12.org/FilesDocs/SelectedReadings.htm>. In addition, a variety of websites exist that provide helpful teaching resources, including <http://www.psychologicaltreatments.org/> (APA Division 12 website on ESTs), <http://effectivechildtherapy.com> (a website constructed by APA Division 53 hosting a speaker series on EBTs for children and families, as well as other resources), and <http://www.therapyadvisor.com/> (a website that provides a summary of evidence-based assessment and treatment for a variety of conditions). Examples of online tutorials on EBP include <http://guides.mclibrary.duke.edu/ebmtutorial> and <http://hsl.lib.umn.edu/learn/ebp/index.html>. For more information about EBP in Medicine, including training opportunities, see

www.cebm.net (the website for the Centre for Evidence-Based Medicine, based in Oxford, UK).

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