

**DEVELOPING EVIDENCE-BASED PRACTICE:  
THE ROLE OF CASE-BASED RESEARCH**

**David J. A. Edwards**

**Rhodes University,**

**Frank M. Dattilio**

**Harvard Medical School,**

**and**

**Dennis B. Bromley**

**University of Liverpool**

**Key Words:**           **Evidence-based practice, empirically supported treatments, case studies, case-based research**

**Running Head:**       **Case-Based Research**

## **ABSTRACT**

How can practitioners engage in evidence-based practice when the evidence for effectiveness of psychological treatments comes from randomized controlled trials using patient populations different from those encountered in everyday settings and treatment manuals which seem oversimplified and inflexible? We argue that important evidence about best practice comes from case-based research, which builds knowledge in a clinically useful manner and complements what is achieved by multivariate research methods. We present a multidimensional model of the research process that includes clinical practice and case-based research as significant contributors. We also summarize the principles of case-based research and provide examples of recent technical advances. Finally, we suggest ways in which practitioners can apply the case-based approach in researching and publishing their own cases, perhaps in collaboration with university-based researchers.

Terms such as “evidence-based practice” (EBP) (Institute of Medicine, 2001) and "empirically supported treatment" (EST) (Chambless & Hollon, 1998; Kendall, 1998; Lyddon & Jones, 2001; Reinecke & Clark, 2003) deliver the important message that clinicians are accountable to their clients and need to have up-to-date information on which treatments have been shown to work. However, under the influence of particular ideological perspectives or market interests they can be appropriated by a rhetoric that promotes simplistic and misleading assumptions which create a number of dilemmas for practitioners. Many of these assumptions are rooted in an overemphasis on the results of randomized controlled trials (RCTs) and a failure to recognize the significance of case-based research in the process of building clinical knowledge. In this paper, we (1) present a model of clinical scientific inquiry which includes case-based research as a fundamental aspect, (2) set out the principles of case-based research, (3) draw out what this means with respect to the nature of EBP, and (4) suggest how practitioners can contribute to the process through systematic studies of their own cases.

Some misunderstandings about the nature of EBP have their roots in the agendas of particular groups. Psychological assessment and treatment is a business and since there is a great deal at stake in terms of financial gain and reputation, it is not surprising that scientific neutrality might sometimes be vulnerable (Miller, 1999). For example, health insurance companies, in seeking to specify the treatment for specific diagnoses as precisely as possible to determine the minimum amount of treatment that can be expected to be effective, creates a market pressure for ESTs to be both short and standardized. In addition, because one of the main forms of treatment funded by medical insurance is medication, there is pressure for ESTs in the form of psychotherapy to be evaluated in the same manner as pharmacotherapy treatments, by means of RCTs in which one or more treatments are pitted against each other and a placebo. Treatments are operationalized by means of a treatment manual that specifies

what is to be done in each session and how many sessions there will be. The advantage is that the effectiveness of a manualized treatment can be measured and compared with that of other manualized treatments; the disadvantage is that the manualized treatment may restrict flexibility in the adaptation of the treatment approach to specific aspects of the client's personality and circumstances.

Researchers may argue that giving up the flexibility that is a usual part of clinical practice is a small price to pay for the scientific benefit derived from the progressive and systematic development of manualized treatments (Wilson, Fairburn, & Agras, 1997). However, manuals used in outcome research are not universally welcomed by practitioners. Clinicians may feel that researchers are dictating how they should function in practice (Addis, 2002; Schulte, Bochum, & Eifert, 2002) and point to an excessive emphasis on technique, inadequate attention to the working alliance and a failure to recognize the importance of clinical innovation and the expertise of the therapist (Carroll & Nuro, 2002). At the same time, it is often mistakenly assumed that because a treatment is manualized it is fairly straightforward to administer. In practice most manualized treatments depend on sound clinical skills on the part of practitioners. Clark (2000) reported that experienced therapists who attended a training workshop on delivering treatments for anxiety disorders, obtained markedly poorer outcomes than were obtained in the research studies. Further "top-up" training was needed in order to get expertise to the required level.

The competitive atmosphere among representatives of different psychotherapy traditions also contributes to misleading claims and impressions with respect to the number of people who are actually helped by a treatment that has been shown to be of value in a RCT. In evaluating the effectiveness of cognitive therapy treatments, Clark (2000) used a joint probability index ( $p$  [patient accepts treatment]  $\times$   $p$  [patient responds to treatment]  $\times$   $p$  [patient does not relapse]) and obtained these values: specific phobias (.71); panic disorder (.68);

posttraumatic stress disorder (.40); depression (.38); generalized anxiety disorder (.32). The value for panic disorder is what would be obtained if 88% accepted treatment, 88% of those benefited and 88% of those did not relapse. The value for generalized anxiety disorder is what would be obtained if 70% of patients accepted, 70% of those responded, a 70% of those did not relapse. In the case of panic disorder, therefore, two thirds of patients achieve long term benefit, while for generalized anxiety, only one third do so. These figures show that there is considerable room for improvement in current state-of-the-art treatments for many common disorders.

Another misleading impression that may be created is that unless a treatment has been tested in an RCT, it has no empirical basis whatsoever. Although there is no doubt that the RCT provides a strong form of evidence that is difficult to refute, this does not mean that other types of evidence are not available or that those that are available are worthless. After all, it would be wasteful to commit the considerable expense and effort involved in running RCTs on treatments for which there was not already a strong body of evidence regarding effectiveness. Related to this is a common misuse of the term “empirical” in which it is implied that studies are only empirical if they employ a group comparison method using multivariate statistics. Such usage is simply inaccurate. A study that is scientific, “comes to grips with ... empirical facts at some point and in some way and helps to make them more intelligible” (Philosophy of science, 2003). Case-based methods are also empirical. Indeed, they usually preserve the complexity of the real life situation far better than multivariate studies in which the context and details of everyday clinical phenomena are easily obscured or lost altogether. When properly applied they confront empirical facts in a way that is often more direct than in applications of quantitative multivariate methods where individual experience is simplified and filtered through scales and operational definitions or distorted by

experimental manipulation (Bilisbury & Richman, 2002; Kline, 1998; Michell, 2000; Taylor & Bogdan, 1998).

### **A holistic model of the development of clinical knowledge**

The aim of this paper is to provide a balanced view of the nature of the evidence-base which should inform practice. Kiesler (1981, p. 213) argued that "research is a multidimensional enterprise requiring diverse talents and approaches, all of which have heuristic value," and Salkovskis (2002, p. 1) that the knowledge base that informs clinical practice "progresses through a multidimensional approach to clinical science." This means that different research methods complement each other; case-based studies, multivariate studies, experimental studies and group comparison outcome designs each provide different kinds of evidence which contribute to the scientific process of developing useful knowledge. When the evidence from different kinds of studies is carefully evaluated and integrated, we are in a position to develop "empirically grounded clinical interventions" (Salkovskis, 2002) whose evidence base is not from a single outcome study, but from an integrated review of a range of different kinds of evidence.

#### **Figure 1 about here**

The approach is presented in Figure 1. Applied clinical theory (E) is formulated under the respective influences of everyday clinical practice (A) and science (H). Clinical practice, rather than being a poor relation to science, is conceived of as a significant partner in the process (see also Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). It encompasses a network of intersecting social and professional processes that include supervision, informal discussions with colleagues, case conference presentations and examination of current literature. The submission of case reports for publication in peer-reviewed journals can further enhance the process. Although clinicians may act to reinforce each other's prejudices

(Strupp, 1981), in practice, case conferences attended by staff from varied training and professional backgrounds and with a commitment to a scientific attitude (H) provide opportunities to sort out the biases and expectations regarding treatment and interpretation that clinicians inevitably bring to their work (Miller, 1999). Such professional activities, which have their counterparts in other disciplines, comprise one of the main contexts within which clinical theory is progressively refined. This kind of theory draws little from formal experimental research (Jones, 1993; Stein, 1997), but is built from the ground up, so to speak, as clinicians formulate and revise their psychological understanding of their clients and construct models of the relevant psychological processes.

Clinical theory (E) provides the basis for the development of treatment models (D) for specific presenting problems or disorders. These may be more or less tightly operationalized in manualized treatment protocols or as broader guidelines for practice. These models can, in turn, be tested in two ways: in intensive studies of new cases (B), and in RCTs (F) which provide a critical test of the value of all that has gone into the development of a treatment. Theory building has little value if treatments fail to help a significant number of individuals. In the end, clinical impressions, the rhetoric and hyperbole of the marketing team and enthusiasm for specialized healing discourses, whether medical or psychological must be tempered by the data and, if the treatment does not outperform the placebo, expect to be overhauled.

In the design of RCTs, steps are taken to maximize the possibility of obtaining evidence about treatment outcome. But this limits their usefulness for testing propositions about the processes involved in achieving treatment outcome. Where two contrasting treatments are shown to be equally effective, a study may provide no information as to whether they worked in a similar or a different manner. Yet, as scientists and clinicians, we not only want to predict the outcome of treatments, we want to understand how they work so

that we can adapt them to new situations. If sufficient dependent measures are administered as part of a RCT, some clinical hypotheses can be tested. For example, Teasdale et al. (2001) showed that risk of relapse in depressed clients, whether treated with medication or with medication plus cognitive therapy, was associated with extreme responding (in either direction) on various measures of cognitive distortions and cognitive style. However, findings from RCTs are usually rather broad in character and there is a limit to what questions can be answered about the actual processes that occurred during treatment.

Case-based studies (B) enable us to refine clinical treatment models as well as to test and refine the theory on which the models are based. They provide answers to more detailed questions about process, since they allow for the gathering of extensive information in the form of repeated quantitative measures as well as qualitative information about the process of each session and relevant events between sessions, such as the response to homework assignments. Information with regard to the point at which significant change occurred and what the client experienced as producing significant cognitive, behavioral or emotional shifts allows for detailed testing of the clinical model on which the treatment is based (Bates & Clark, 1998; Stiles, 2003; Wells & Papageorgiou, 1997).

Clinical interventions can further be empirically grounded by experimental studies (C) that test aspects of the underlying theory. Such studies are advancing our understanding of the development and maintenance of posttraumatic stress disorder (Ehlers & Clark, 2000; Harvey & Bryant, 1999). When the findings of experimental studies are in accord with theory derived from clinical practice, they enhance confidence regarding the underlying rationale for the treatment. The overall context of science (H) with its carefully formulated principles for deriving valid knowledge from empirical data, directly influences the knowledge building process by informing case conceptualization and evaluation of response to treatment within clinical practice (A), as well as the design of research studies, whether



case-based (B), experimental tests (C), or RCTs (F). Clinical theory is also influenced by concepts and theories derived from related scientific fields (G), for example, concepts from cognitive science (Bowlby, 1979; Horowitz, 1988; Stein, 1997; Teasdale, 1997) and evolutionary theory (Gilbert, 2002; Kriegman, 1998; Langs, 1996) have influenced theories of therapists of varying orientations.

### **The complementarity of case-based and multivariate group comparison research**

Case-based research uses a variety of methodologies. Although "case study" may broadly refer to any of these, there are many other terms in use. Hilliard (1993) uses the term "case study" where the data are in the form of a narrative and methods of analysis are qualitative. Where the focus is on repeated quantitative measures of one or more variables, he uses the term "single-case experiments" where the independent variable is directly manipulated, or "single-case quantitative analysis", where there is no such manipulation. Such studies are also referred to as N=1 designs (Kratochwill, Mott, & Dodson, 1984). We use the term "case-based research" (Edwards, 1998) because we prefer not to make a rigid distinction between quantitative and qualitative methods. Studies that use a case narrative in conjunction with repeated quantitative measures (e.g., Edwards, Henwood, & Kannan, 2003) allow for multiple strategies for investigating and testing hypotheses.

Although case-based methods became progressively marginalized during the latter half of the twentieth century, they retained a measure of recognition, especially in clinical psychology (Bromley, 1986, 1990; Hayes, 1981; Kazdin, 1981; Shapiro, 1970; Kratochwill, Mott, & Dodson, 1984) and currently there is a resurgence of appreciation of their value (Barker, Pistrang, & Elliott, 1994; Edwards, 1996, 1998; Hilliard, 1993; Jones, 1993; Stake, 1995; Stiles, 2003; Yin, 1994). Unfortunately, however, recognition of their scientific significance has been undermined by a classic dichotomy between an exploratory "context of

discovery" (Giorgi, 1986), that employs methods that generate ideas and hypotheses and provide a preliminary conceptualization of a phenomenon, and a "context of verification", which uses tightly designed experimental studies to enhance the possibility of establishing causal relationships between dependent and independent variables. In this view, case studies are represented as valuable in the discovery phase, for example when examining disorders that feature infrequently in the literature, yet are prevalent enough for clinicians and researchers to require some direction (Dattilio, 2003). However, they are accorded only a limited role in the verification phase because of alleged difficulties in generalizing from them. They are therefore represented as a less advanced form of scientific enquiry (Kazdin, 1981; Kiesler, 1981).

This view seriously misrepresents the potential of case-based research, which can significantly contribute to hypothesis testing and theory development (Bromley, 1990; Campbell, 1994; Jones, 1993; Mahrer, 1988). Eckstein (1975) provides a classic example of how a "crucial case study" (p. 113) settled a longstanding scientific dispute. According to Aristotle, the heavier an object the faster it falls. According to Galileo, all objects fall at the same velocity and acceleration unless affected by other conditions such as air pressure. "Only with the invention of the air pump, about 1650, was a definitive experiment possible: dropping a heavy object (coin) and a light one (feather) in an evacuated tube" (p. 115). Only a single observation was needed to establish that Galileo was right. Well designed case studies in the field of psychotherapy can provide similar crucial tests which have "an inherent persuasiveness that tends to prompt one to revise or refine theory" (Moras, Telfer, & Barlow, 1993, p. 419). This is not to claim that observations within cases can test all hypotheses, or to deny that many hypotheses are best tested by group comparison designs using randomized samples.

Unfortunately, observations from case studies that do not conform to hypotheses supported by multivariate studies are routinely dismissed as "anecdotal." This term betrays an ignorance of the fact that the underlying logic through which clinical knowledge is built up from cases is different from that used in the interpretation of multivariate studies. "Viewing single-case research along the same lines as group research is highly misleading," observes Hilliard (1993, p. 373). It uses a complementary system of argument that is as central to science as the logic of testing theory using multivariate methodology. Hilliard (1993) identifies two features that anchor the logic of case-based knowledge building. The first feature is a focus is on intrasubject rather than intersubject variation. Case-based research is largely longitudinal in nature and allows for the examination of the detailed unfolding of events across time (Jones, 1993; Jones, Ghannam, Nigg, & Dyer, 1993). Psychotherapy outcomes as investigated in RCTs are a consequence of a series of smaller change events within individual cases, and intensive case analysis allows us "to discover how the therapist's interventions and patient's responses (i.e., the therapeutic process) contribute to or explain these smaller changes" (Hilliard, 1993, p. 374). These processes cannot be examined by means of cross-sectional group comparison studies.

The second feature is that generalization is not based on aggregation across cases (as occurs when statistics such as a mean or correlation coefficient are calculated from a sample), but on replication on a case-by-case basis (Moras et al., 1993). Stiles (2003) points out that although "isolated descriptive statements drawn from a case study can't be confidently generalized," when a large number of observations from the case correspond with what is already present in the theory, the evidence gained is as persuasive as that obtained in studies using statistical hypothesis testing:

A few systematically analyzed cases that match a theory in precise or unexpected detail may give people considerable confidence in the theory as a

whole even though each component assertion may remain tentative and uncertain" (p. 7).

The first step in theory building is to document a process in one case. The next step is to demonstrate the same process in similar cases. After that, other cases are sought that differ in important respects, or within which it might be expected that different processes might take place. In this way, a theoretical structure of distinctions, principles and hypotheses is formulated and progressively refined to account for the whole range of phenomena observed in all cases (Miles & Huberman, 1994). This procedure corresponds to the way cases are accumulated in jurisprudence that provides a convincing method of organizing knowledge through generalizing and testing hypotheses based on case studies. Using this analogy, the resulting theory can be termed "case law" (Bromley, 1986). In principle, the process is the same as the development of what Fishman (1999) terms "pragmatic psychology" and Strauss and Corbin (1994) call "grounded theory". All these authors emphasize the evidence-based nature of the theory that is generated in this way: is grounded in the data of cases, it is testable against new cases and its generalizations are lawful relationships between operationalized phenomena that have been observed and replicated. Furthermore, it has immediate practical application since it is not obscure or removed from the phenomena that it addresses.

Several other strategies are used in theory building to combat factors that might lead to erroneous conclusions. Conclusions must be established on the basis of a valid chain of reasoning linked to empirical data (Yin, 1994). "Plausible rival hypotheses" must be identified and eliminated by means of examining "extended networks of implications" in the case in question as well as in other cases (Campbell, 1994, p. ix). The extent to which this can be done depends on the quality and extensiveness of the data that has so far been collected. Because human life is so rich and complex, it seems probable that in any specific

area of psychopathology and treatment there will always be room for new observations within cases that will contribute to and extend theory. This kind of clinical knowledge building cannot be achieved through group comparison research (Kratochwill, Mott & Dodson, 1984; Miller, 1998). It is no exaggeration to claim that the study of cases is the "bedrock of scientific investigation" (Bromley, 1986, p. ix), and, as Mahrer (1988, p. 697) observes, it is a mistake to dismiss it as "a somewhat useful secondary tool for the serious work of scientific hypothesis testing."

While the value of case-based research has been seriously underestimated, significant problems associated with multivariate studies have tended to be ignored. Like any other research method, quantitative group comparison studies are vulnerable to error through mistakes, carelessness, or dubious practices during their design, administration, or interpretation. The technology involved rests on many assumptions, including the measurement assumptions underlying the original data, and the assumptions underlying the subsequent statistical analysis. It is widely recognized that these assumptions are not always met. It is also easy to forget that the numbers assigned when we score psychological attributes such as a person's compliance or resolve are not "quantitative" in the strict sense of that word (Kline, 1998; Michell, 2000). There is no objective anchoring as is the case with measures of objective attributes, such as mass, memory span, or performance on a task. In a typical standardized test, the meaning of the numbers depends on understanding how the psychological attributes have been defined and assessed, and the variables that are measured are constructions embedded within the complex assumptions of the theories that gave rise to them. A more important limitation is that psychometric scales, because they are designed to measure properties that can be measured in a stable manner in heterogeneous populations, have limited application to the experiences of individuals and may be insensitive to actual clinical changes in response to psychotherapy (Bilsbury & Richman, 2002). None of this is

said to discredit research based on multivariate statistics and psychometric scales. Indeed, both are increasingly used within the case-based research paradigm (Moras, et al., 1993; Spence, Dahl, & Jones, 1993). It is rather to emphasise Kiesler's (1981, p. 213) point that "all research is flawed ... scientific progress results from repeated empirical attacks on a problem ... no single study ... is worth much in and of itself".

Nevertheless the limitations of case-based research have been so exaggerated that remarkably few studies are published. Electronic database searches of psychology and psychiatry journals for the 25-year period from 1978 to 2003 yielded 6091 case studies from PsychINFO and 15,433 from Medline: fewer than 1000 case studies per year. This remarkably low figure is a consequence of the hegemony of the perspective that privileges methodologies using multivariate statistics at the expense of case-based research and reflects the difficulty in obtaining funding for case-based research (Moras et al., 1993, p. 417). The marginalization of case-based research also contributes to an alienation between researcher and practitioner that has been widely commented on (Barlow, 1981; Chambless & Hollon, 1998; Clark & Reinecke, 2003; Dattilio, 2002a; Lyddon & Jones, 2001; Safran, Greenberg, & Rice, 1988; Silverman, 2001; Strupp, 1981). As Jones (1993, p. 371), observed, "much of the therapy research enterprise has remained peripheral to clinical practice and to the major theoretical and intellectual currents in the field." Case studies in narrative format engage readers meaningfully with the material. Through seeing how treatment actually unfolds they can rapidly integrate the implications into their own explicit and implicit frameworks of clinical knowledge. By contrast, research results in the form of descriptive and inferential statistics may be much more difficult to assimilate. This intrinsic appeal is often interpreted to mean that although individual cases may be valuable in education and training, they are of limited scientific significance. We argue that the value of case studies in training is a

consequence of their scientific value and follows from the fact that in practice they do yield valid knowledge.

### **Case study standards and the art and science of case reports**

In practice, case-based theory has been at the heart of the development of many particular interventions used in RCTs of psychotherapy treatments. For example, the kinds of principles and detailed interventions used in trials of cognitive therapy were described by Beck and his collaborators some 20 years ago (Beck & Emery, 1985; Beck, Rush, Shaw, & Emery, 1979) on the basis of close observations of individual cases, and have been progressively modified and refined ever since, to address an ever widening range of clinical presentations. However, the case database for this kind of theory building has been largely implicit. Few cases are actually reported in the literature in a way that enables their contribution to theory building to be objectively assessed. Most are not reported on at all, while others appear in reduced form as brief case examples of particular clinical phenomena.

The case-based research process would best be served by developing such databases as an explicit public reference point. This would require the publication of more case studies, and the development of a generally accepted philosophical and practical infrastructure for case study methodology analogous to that of traditional experimental and quantitative research (Miller, 1999). This infrastructure would include consensually agreed guidelines for the construction of case-based reports that would ensure that their scientific value in the generation and testing of theory. Models for case reports can be found in the collections of case studies that have long been a regular feature of the clinical literature (e.g., Blackburn & Twaddle, 1996; Freeman and Dattilio, 1992). The recently founded journal, *Clinical Case Studies* prescribes a format that includes: theoretical and research basis, case introduction, presenting complaints, history, assessment, case conceptualization, course of treatment and

assessment of progress, complicating factors, follow-up, treatment implications of the case and recommendations to clinicians and students.

However, the composition of reports is time-consuming and calls for a high level of skill and even artistry, because a large amount of material has to be organized and reduced to manageable proportions. Conceptual routines for describing prototypical cases can be acquired through training and experience (Bromley, 1991). This involves a "knowledge transforming" process (Bereiter & Scardamalia, 1987) through which the raw data of the case are selected and structured thematically in terms of clinically relevant concepts and questions and integrated into accepted knowledge structures.

Communities of clinicians and researchers who share a common discourse build a shared conceptual and procedural framework that enhances communication and mutual understanding. Within this evolve scientific and professional standards regarding the procedures involved in data collection, report writing, treatment planning and evaluation of outcome. For example, in cognitive-behavior therapy, case material is typically organized in terms of the predisposing, precipitating and maintaining factors that are understood to have contributed or to be contributing to the presenting problems. In addition, attention is paid to particular psychological processes such as automatic thoughts, underlying assumptions, core beliefs and the manner in which these interact with specific experiences and behaviors to create positive feedback loops or chronically self-defeating patterns (Leahy, 1996, Chapter 10; Tompkins, 1997). Although psychodynamic case formulations may focus more on predisposing factors in terms of effects of early parental relationships and identification with parents (Silberschatz & Curtis, 1993), there are marked similarities between psychodynamic and cognitive-behavioral formulations (Persons, Curtis, & Silberschatz, 1991).

A case formulation approach can contribute towards the overall coherence of the report, that is to the general credibility of the argument and the extent to which the account is



relevant, systematic, complete and without internal contradiction. Coherence is achieved by focusing on a limited number of main points, offering arguments for and/or against particular assertions, providing examples to illustrate a point, offering background information to bolster the points being made, resolving apparent contradictions in the account, explaining omissions in the data, making evaluations of the validity or utility of the information presented and showing the connections among different aspects of the case. Case formulation can also contribute to a report's cohesion, that is, the extent to which the ideas expressed in different sections of the text are thematically and theoretically connected. Any case report is inevitably compiled as a linear sequence of words, even though it must somehow express a range of technical ideas that interlock in complex ways. Cohesion can also be attained by means of tables and diagrams to depict theoretical relationships or practical connections.

### **Improving the quality of case-based evidence**

Because their construction is a complex process, the evidential value of case reports has been criticized. It has been claimed that they are always deeply influenced by the subjectivity of the author and that there is an inevitable selection and "narrative smoothing" that shapes the material to favor the writer's preferred conclusions (Spence, 1986). Critics also argue that authors of case reports often reach conclusions that cannot be sustained when subjected to critical scrutiny, and the clinical theory on which conclusions are based may itself be speculative and riddled with untestable hypotheses and ungrounded generalizations. It is an overreaction to use the existence of some poorly argued case studies as a basis for discrediting all case-based research. Provided that the principles of case-based knowledge building can be articulated and more widely understood, consensus can develop about what generalizations can be sustained from a series of case studies. Like all researchers, those

using case-based methodologies must build in strategies for safeguarding accuracy, checking replicability and ensuring the validity of arguments. In psychotherapy research this can be achieved by making sure that all sessions are tape-recorded, using independent judges to check that the reduction of the raw data into case narratives is not biased by a customized selection of material and employing self-report scales or behavioral observations that are repeatedly collected throughout the study to provide an additional information source against which to interpret the meaning of developments within the case narrative (Barker, Pistrang & Elliot, 1994; Kazdin, 1981; Petermann & Müller, 2001; Safran, Crocker, McMain, & Murray, 1990; Silberschatz & Curtis, 1993).

Recent technical advances in approaches to data collection and analysis can greatly enhance the degree to which accuracy, replicability and validity can be established. Bilsbury and Richman (2002) argue that changes in a clinical condition are better revealed by a patient's assessment of his or her progress (or regress) than by psychometric measures of abstract constructs. Psychological disorders have a "natural history;" a series of qualitative stages can be identified from the first indications and progressing to its climax. Similarly, recovery from a disorder has a reverse natural history as the patient progresses through a series of stages from the first signs of remission to full or partial recovery. The sequence may be unique from case to case and therefore will be imperfectly tracked by psychometrically derived measures. Idiographic rating scales can be constructed that reflect the categories used by clients themselves to describe their own experience and which address phenomena of direct clinical relevance within the specific case. Repeated use of such a scale provides a record of response to treatment that is likely to be more sensitive than one using standard psychometric scales.

Independent judges can rate recorded psychotherapy sessions using a Q-sort method which "can capture the uniqueness of each therapy hour as well as permit the assessment of

similarities and dissimilarities of one treatment hour to another" (Jones et al., 1993, p. 384).

Data across a large number of sessions can be factor analyzed to identify process dimensions that characterize the case. Factor scores reflecting these process dimensions can, in turn, be submitted to time series analysis to reveal complex patterns of relationship among variables within the therapy. In this way, Jones et al. demonstrated aspects of the reciprocal influence of therapist and patient over the course of therapy.

In two studies, the psychoanalytic construct of defensiveness was operationalized and measured. Using judges' ratings of recordings of sessions, Horowitz et al. (1993) were able to establish that, when discussing a particular emotionally distressing event, the patient showed a distinctive pattern that included more limited verbal elaboration accompanied by non-verbal markers of emotionality, non-verbal attempts to ward off threat, such as hiding his face and avoiding gaze and lower heart rate (probably associated with inhibition of emotional expression). Spence et al. (1993) used a measure of associative strength between nouns for a time series analysis of sessions of a long psychoanalytic psychotherapy. It was hypothesized that a high co-occurrence rate (COR) of associated words indicated a less defensive style and more associative freedom on the part of the patient. In the early stages of the therapy, the therapist's interpretations tended to reduce COR (i.e. increase patient defensiveness), whereas later in the therapy, as the relationship between patient and therapist became more intimate, the client responded to interpretation with more associative freedom.

A case-comparison method described by Ragin (1987) provides for the analysis of nominal attributes across a set of cases. Cases are classified into types according to which combination of attributes they possess. The relationship is examined between each combination and a particular outcome, such as fulfilling or not fulfilling a clinical prediction. An investigator interested in four attributes would tabulate all possible 16 combinations, ranging from all absent to all present and the available cases would be classified in terms of

their own particular combinations of attributes. Next, the outcome (success, failure, or ambiguous) for each combination is recorded. With a small number of attributes, the relationships between the outcomes and the various combinations of attributes are likely to be obvious by inspection. With a large number of attributes, Boolean algebra is used to clarify the relationships.

### **Conclusions and recommendations**

What does all this mean for evidence-based practice? Sackett, one of the significant contributors to the development of the concept, defined it as “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients, [which] means integrating individual clinical expertise with the best available external clinical evidence from systematic research” (Sackett et al., 1996, p. 71). Thus, in respect of each case they treat, practitioners have the responsibility of evaluating the current research evidence from multivariate experimental and outcome studies on the one hand and case-based research on the other. As we have seen, the research processes that contribute to the development of clinical knowledge are interdependent and none can be carved out of the overall system and privileged as “more scientific.” Clinical knowledge calls for judicious use of a combination of research methods that complement and cross check each other.

Practitioners must find a means of weighing in a considered manner the different kinds of evidence each contributes. The disadvantage of drawing purely on clinical experience is well known: it is easy to be misled about the particular aspects of one’s practice that bring about positive change. A salutary warning is provided when a RCT shows that a particular treatment does no better than placebo. However, where a RCT shows that a treatment is more effective than placebo it may tell us only that the treatment includes something important. It is the preceding case-based studies that investigate the detailed processes on which treatment

effectiveness depends. A limitation of multivariate studies is that the statistical procedures they employ deduce the properties of a population from those of a sample; they cannot deduce from a sample the properties of individual cases (Bilsbury & Richman, 2002). Yet this is what practitioners need to know. The RCT that shows that a treatment helps 40 percent of clients does not tell me if the client who enters my office today is one of them. Although they can identify broad predictor variables (gender, age, co-morbid diagnoses, personality traits), these tend to be of limited clinical usefulness. Case-based research can provide a therapist with more differentiated knowledge with respect to aspects of clients' motivation, attitude or belief that are likely to impact on engagement with treatment and with respect to how to respond effectively to the details of clients' emotions, thoughts and behavior as the treatment unfolds.

Finally, we offer recommendations that help to bridge the gap between practitioner and researcher. First, we would encourage active collaboration between practitioners and university-based researchers. Where practitioners do not have the time to do so, there may be opportunities for Master's and Doctoral students to turn the raw data of a carefully documented case into a scientific case study. Second, it is important to conceptualize cases within the framework of current case law. The current literature provides many clear statements of the state of case law with respect to particular DSM-IV mental disorders as well as specific clinical problems. Third, be on the look out for cases that can be treated in terms of current case law and which enable specific aspects of it to be tested. Fourth, document the assessment and treatment of each case by systematically summarizing information, keeping tape-recordings of sessions and using self-report measures that can be completed at each session (Bilsbury & Richman, 2002; Parry, Shapiro, & Firth, 1986; Petermann & Müller, 2001). Fifth, within the process of treatment, investigate the claims of existing theory and pay attention to obstacles to treatment or processes that call for extension of what is presented in

research treatment manuals. Studies of treatment failures are of particular value in this regard (Barlow, 1981; Foa & Emmelkamp, 1983). The literature on personality disorders and motivational interviewing (e.g. Newman & Ratto, 2003; Miller & Rollnick, 1991; Young, Klosko, & Weishaar, 2003) already contains a great deal of case-based knowledge about obstacles to treatment progress as well as strategies for addressing them. Sixth, investigate the extent to which a research-based treatment (with its special training for practitioners, detailed manuals and supervisory support) is “transportable” to real world settings where resources are limited, practitioners have less than ideal levels of training and the client population is more diverse than in the research studies (Schoenwald & Hoagwood, 2001). Seventh, use the case-based model as a framework for writing case studies for publication either in journals such as *Clinical Case Studies* or specialist journals which address the specific areas of clinical concern relevant to the case (e.g. Bates & Clark, 1998; Dattilio, 2002b, 2003; Dattilio & Castaldo, 2001; Edwards et al., 2003; Wells & Papageorgiou, 1997). If these recommendations can be applied, practitioners can play a meaningful role in furnishing the "data that have been missing to date from traditional clinical research" (Barlow, 1981, p. 153) and, in so doing, providing a resource that is essential for the conduct of a genuine and responsible evidence-based practice.

#### **Authors' Note**

The authors wish to thank Eric Frey of Lehigh University for his assistance with the literature search and Dr. Robert M. Gordon for his helpful comments on an early draft of this manuscript. David Edwards acknowledges the assistance of a research grant from the Rhodes University Joint Research Committee.

## References

- Addis, M. E. (2002). Methods for disseminating research products and increasing evidence-based practice: Promises, obstacles, and future directions. *Clinical Psychology: Science and Research, 9*, 367-378.
- Barker, C., Pistrang, N., & Elliot, R. (1994). *Research methods in clinical and counseling psychology*. Chichester: John Wiley.
- Barlow, D. H. (1981). On the relation of clinical research to clinical practice: Current issues, new directions. *Journal of Consulting and Clinical Psychology, 49*, 147-155.
- Bates, A., & Clark, D. M. (1998). A new cognitive treatment for social phobia: A single case study. *Journal of Cognitive Psychotherapy, 12*, 289-302.
- Beck, A. T. & Emery, G. (1985). *Anxiety disorders and phobias: A cognitive approach*. New York: Basic Books.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York: John Wiley.
- Bereiter, C. & Scardamalia, M. (1987). *The psychology of written composition*. Hillsdale, NJ: Erlbaum.
- Bilsbury, C. D., & Richman, A. (2002). A staging approach to measuring patient-centred subjective outcomes. *Acta Psychiatrica Scandinavica* (Supplementum no. 414), 106, 1 - 40.
- Blackburn, I-M., & Twaddle, V. (1996). *Cognitive therapy in action: A practitioner's casebook*. London: Souvenir Press.
- Bowlby, J. (1979). *The making and breaking of affectional bonds*. London: Tavistock.
- Bromley, D. B. (1986). *The case-study method in psychology and related disciplines*. Chichester, UK: Wiley.

- Bromley, D. B. (1990). Academic contributions to psychological counselling. 1. A philosophy of science for the study of individual cases. *Counseling Psychology Quarterly*, 3, 299 - 307.
- Bromley, D. B. (1991). Academic contributions to psychological counselling. 2. Discourse analysis and the formulation of case-reports. *Counseling Psychology Quarterly*, 4, 75 - 89.
- Campbell, D. T. (1994). Foreword. In R. K. Yin, *Case study research: Design and methods* (2nd ed.), (pp. ix-xi). Thousand Oaks CA: Sage.
- Carroll, K. M., & Nuro, K. F. (2002). One size cannot fit all: A stage model for psychotherapy manual development. *Clinical Psychology: Science and Practice*, 9, 367-378.
- Chambless, D. L. & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology*, 66, 7-15.
- Clark, D. M. (2000, June). *Empirically derived cognitive therapy for anxiety disorders*. Paper presented at the International Congress of Cognitive Therapy, Catania, Sicily.
- Clark, D. A., & Reinecke, M. A. (2003). Cognitive therapy in the twenty-first century: Current status and future directions. In M. A. Reinecke, & D. A. Clark (Eds.), *Cognitive therapy across the lifespan: Evidence and practice* (pp. 507-528). Cambridge: Cambridge University Press.
- Dattilio, F. M. (2002a). A bridge and a couple of fences for clinicians and researchers: A comment on Silverman's (2001) editorial. *Psychotherapy: Theory/Research/Practice and Training*, 39, 261-263.
- Dattilio, F. M. (2002b). The use of Kava and cognitive-behavior therapy in the treatment of panic. *Cognitive and Behavioral Practice*, 9(2), 83-88.



- Dattilio, F. M. (2003). Emetic exposure and desensitization procedures in the reduction of nausea and fear of emesis. *Clinical Case Studies*, 2(2), 1-12.
- Dattilio, F. M., & Castaldo, J. E. (2001). Differentiating symptoms of anxiety from relapse of Guillain Barré Syndrome. *Harvard Review of Psychiatry*, 9, 260-265.
- Eckstein, H. (1975). Case study and theory in political science. In F. I. Greenstein & N. W. Polsby (Eds.), *Handbook of political science: Vol. 7. Strategies of enquiry* (pp. 79-137). Reading, MA: Addison-Wesley.
- Edwards, D. J. A. (1996). Case study research: The cornerstone of theory and practice . In M. Reinecke, F. M. Dattilio, & A. Freeman (Eds.), *Cognitive therapy with children and adolescents: A casebook for clinical practice* (pp. 10-37) New York: Guilford.
- Edwards, D. J. A. (1998). Types of case study work: A conceptual framework for case-based research. *Journal of Humanistic Psychology*, 38(3), 36-70.
- Edwards, D. J. A., Henwood, J. & Kannan, S. (2003). Cognitive therapy for social phobia: The human face of cognitive science. *Alternation*, 10 (2), 122-150.
- Ehlers, A. & Clark, D. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38, 319-345.
- Fishman, D. B. (1999). *The case for pragmatic psychology*. New York: New York University Press.
- Foa, E. B. & Emmelkamp, P. M. G. (Eds.). (1983). *Failures in behavior therapy*. New York: John Wiley.
- Freeman, A. & Dattilio, F. M. (Eds.). (1992). *Comprehensive casebook of cognitive therapy*. New York: Plenum.
- Gilbert, P. (2002). Evolutionary approaches to psychopathology and cognitive therapy. *Journal of Cognitive Psychotherapy*, 16, 263-294.

- Giorgi, A. (1986). The "Context of discovery/context of verification" distinction and descriptive human science. *Journal of Phenomenological Psychology, 17*, 151-166.
- Harvey, A. G. & Bryant, R. A. (1999). A qualitative investigation of the organization of traumatic memories. *British Journal of Clinical Psychology, 38*, 401-405.
- Hayes, S.C. (1981). Single case experimental design and empirical clinical practice. *Journal of Consulting and Clinical Psychology, 49*, 193-211.
- Hilliard, R. B. (1993). Single-case methodology in psychotherapy process and outcome research. *Journal of Consulting and Clinical Psychology, 61*, 373-380
- Horowitz, M. (1988). *Introduction to psychodynamics: A new synthesis*. London: Routledge.
- Horowitz, M. J., Stinson, C., Curtis, D., Ewert, M., Redington, D., Singer, J., et al. (1993). Topics and signs: Defensive control of emotional experience. *Journal of Consulting and Clinical Psychology, 61*, 421-430.
- Institute of Medicine (2001). *Crossing the quality chasm: A new health system for the 21<sup>st</sup> century*. Institute of Medicine: Washington, DC.
- Jones, E. E. (1993). Introduction to special section: Single-case research in psychotherapy. *Journal of Consulting and Clinical Psychology, 61*, 371-372.
- Jones, E. E., Ghannam, J., Nigg, J. T., & Dyer, J. F. P. (1993). A paradigm for single-case research: The time series study of a long-term psychotherapy for depression. *Journal of Consulting and Clinical Psychology, 61*, 381-394.
- Kazdin, A. E. (1981). Drawing valid inferences from case studies. *Journal of Consulting and Clinical Psychology, 49*, 183-192.
- Kendall, P. C. (1998). Empirically supported psychological therapies. *Journal of Consulting and Clinical Psychology, 66*, 3-6.
- Kiesler, D. J. (1981). Empirical clinical psychology: Myth or reality? *Journal of Consulting and Clinical Psychology, 49*, 212-215.

- Kline, P. (1998). *The New Psychometrics: Science, Psychology and Measurement*. London: Routledge.
- Kratochwill, T. R., Mott, S. E., & Dodson, C. L. (1984). Case study and single-case research in clinical and applied psychology. In A. S. Bellack & M. Hersen (Eds.), *Research methods in clinical psychology* (pp. 55-99). New York: Pergamon.
- Kriegman, D. (1998). Interpretation, the unconscious and analytic authority: Toward an evolutionary biological integration of the empirical-scientific method with the field-defining, empathic stance. In R. F. Bornstein & J. M. Masling (Eds.), *Empirical perspectives on the psychoanalytic unconscious* (pp. 187-272). Washington, DC: American Psychological Association.
- Langs, R. (1996). *The evolution of the emotion-processing mind*. London: Karnac.
- Leahy, R. L. (1996). *Cognitive therapy: Basic principles and applications*. Northvale, NJ: Jason Aronson.
- Lyddon, W. J. & Jones, J. V. (Eds.). (2001). *Empirically supported cognitive therapies: Current and future applications*. New York: Springer.
- Mahrer, A. R. (1988). Discovery-oriented psychotherapy research: Rationale and aims. *American Psychologist*, 43, 694-702.
- Michell, J. (2000). Normal science, pathological science and psychometrics. *Theory and Psychology*, 10, 639-668.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks: Sage.
- Miller, R. B. (1998). Epistemology and psychotherapy data: The unspeakable, unbearable, horrible truth. *Clinical Psychology: Science and Practice*, 5, 242-250.
- Miller, R. B. (1999). *Doing Justice to the Case Study Method*. Paper presented at the APA Annual Convention, Boston, MA.

- Miller, W. R. & Rollnick, S. (1991). *Motivational interviewing: Preparing people to change addictive behavior*. New York: Guilford.
- Moras, K., Telfer, L. A., & Barlow, D. H. (1993). Efficacy and specific effects data on new treatments: A case study strategy with mixed anxiety-depression. *Journal of Consulting and Clinical Psychology*, *61*, 412-420.
- Newman, C. F., & Ratto, C. L. (2003). Narcissistic personality disorder. In M. A. Reinecke, & D. A. Clark (Eds.), *Cognitive therapy across the lifespan: Evidence and practice* (pp.172-201). Cambridge: Cambridge University Press.
- Parry, G., Shapiro, D. A., & Firth, J. (1986). The case of the anxious executive: A study from the research clinic. *British Journal of Medical Psychology*, *59*, 221-233.
- Persons, J., Curtis, J. T., & Silberschatz, G. (1991). Psychodynamic and cognitive-behavioural formulations of a single case. *Psychotherapy: Theory/Research/Practice/Training*, *28*, 608-617.
- Petermann, F., & Müller, J. M. (2001). *Clinical psychology and evidence-based practice: A practical approach to treatment planning and evaluation*. New York: Wiley.
- Philosophy of science (2003). *Britannica 2003 Ultimate Reference Suite* [CD-ROM]. London: Encyclopedia Britannica.
- Ragin, C. C. (1987). *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. Berkeley, CA: University of California Press.
- Reinecke, M. A., & Clark, D. A. (2003). Cognitive therapy across the lifespan: Conceptual horizons. In M. A. Reinecke, & D. A. Clark (Eds.), *Cognitive therapy across the lifespan: Evidence and practice* (pp. 1-11). Cambridge: Cambridge University Press.
- Sackett, D., Rosenberg, W., Gray, J., Haynes, R., & Richardson, W. (1996). Evidence-based medicine: What it is and what it isn't. *British Medical Journal*, *312*, 71-72.

- Safran, J.D., Crocker, P., McMMain, S. & Murray, P. (1990). Therapeutic alliance rupture as a therapy event for empirical investigation. *Psychotherapy: Theory/Research/Practice/Training*, 27, 154-165.
- Safran, J., Greenberg, L. S., & Rice, L. (1988). Integrative psychotherapy research and practice: Modeling the change process. *Psychotherapy: Theory/Research/Practice/Training*, 25, 1-17.
- Salkovskis, P. M. (2002). Empirically grounded clinical interventions: Cognitive-behavioral therapy progresses through a multi-dimensional approach to clinical science. *Behavioural and Cognitive Psychotherapy*, 30, 1-10.
- Schoenwald, S. K., & Hoagwood, K. (2001). Effectiveness, transportability, and dissemination of interventions: What matters when? *Psychiatric Services*, 52, 1190-1197.
- Schulte, D., Bochum, R. U., & Eifert, G. H. (2002). What to do when manuals fail? The dual model of psychotherapy. *Clinical Psychology: Science and Practice*, 9, 312-328.
- Shapiro, M. B. (1970). Intensive assessment of the single case: An inductive-deductive approach. In P. Mittler (Ed.), *The psychological assessment of mental and physical handicaps* (pp. 645-666). London: Methuen.
- Silberschatz, G. & Curtis, J. T. (1993). Measuring the therapist's impact on the patient's therapeutic progress. *Journal of Consulting and Clinical Psychology*, 61, 403-411.
- Silverman, W. (2001). Editorial: Clinicians and researchers: A bridge to nowhere? *Psychotherapy: Theory/Research/Practice/Training*, 38, 249-251.
- Spence, D. P. (1986). Narrative smoothing and clinical wisdom. In T. R. Sarbin (Ed.), *Narrative psychology: The storied nature of human conduct*. New York: Praeger.
- Spence, D. P., Dahl, H., & Jones, E. E. (1993). Impact of interpretation on associative freedom. *Journal of Consulting and Clinical Psychology*, 61, 395-402.

- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks CA: Sage.
- Stein, D. (Ed.). (1997). *Cognitive science and the unconscious*. Washington, DC: American Psychiatric Press.
- Stiles, W. B. (2003). When is a case study scientific research? *Psychotherapy Bulletin*, 38, 6-11.
- Strauss, A., & Corbin, J. (1994). Grounded theory methodology. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 273-285). Thousand Oaks, CA: Sage.
- Strupp, H. H. (1981). Clinical research, practice, and the crisis of confidence. *Journal of Consulting and Clinical Psychology*, 49, 216-219.
- Taylor, S. J., & Bogdan, R. (1998). *Introduction to qualitative research methods: A guidebook and resource* (3rd ed.). New York: Wiley.
- Teasdale, J. D. (1997). The transformation of meaning: The Interacting Cognitive subsystems approach. In M. Power & C. R. Brewin (Eds.), *The transformation of meaning in psychological therapies: Integrating theory and practice* (pp. 141-156). New York: Wiley.
- Teasdale, J. D., Scott, J., Moore, R. G., Hayhurst, H., Pope, M., & Paykel, E. S. (2001). How does cognitive therapy prevent relapse in residual depression? Evidence from a controlled trial. *Journal of Consulting and Clinical Psychology*, 89, 347-357.
- Tompkins, D. (1997). Case formulation in cognitive therapy. In, R. L. Leahy (Ed.), *Practising cognitive therapy: A guide to interventions* (pp. 37-59). Northvale, NJ: Jason Aronson.
- Wells, A., & Papageorgiou, C. (1997). Brief cognitive therapy for social phobia: A case series. *Behaviour Research and Therapy*, 39, 713-720.

Wilson, G. T., Fairburn, C. G., & Agras, W. S. (1997). Cognitive behavioral therapy for bulimia nervosa. In, D. M. Garner, & P. E. Garfinkel (Eds.). *Handbook of treatment for eating disorders* (2nd ed.) (pp.67-93). New York: Guilford.

Yin, R. K. (1994). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage.

Young, J. E., Klosko, J. S., & Weishaar, M. E. (2003). *Schema therapy: A practitioner's guide*. New York: Guilford.

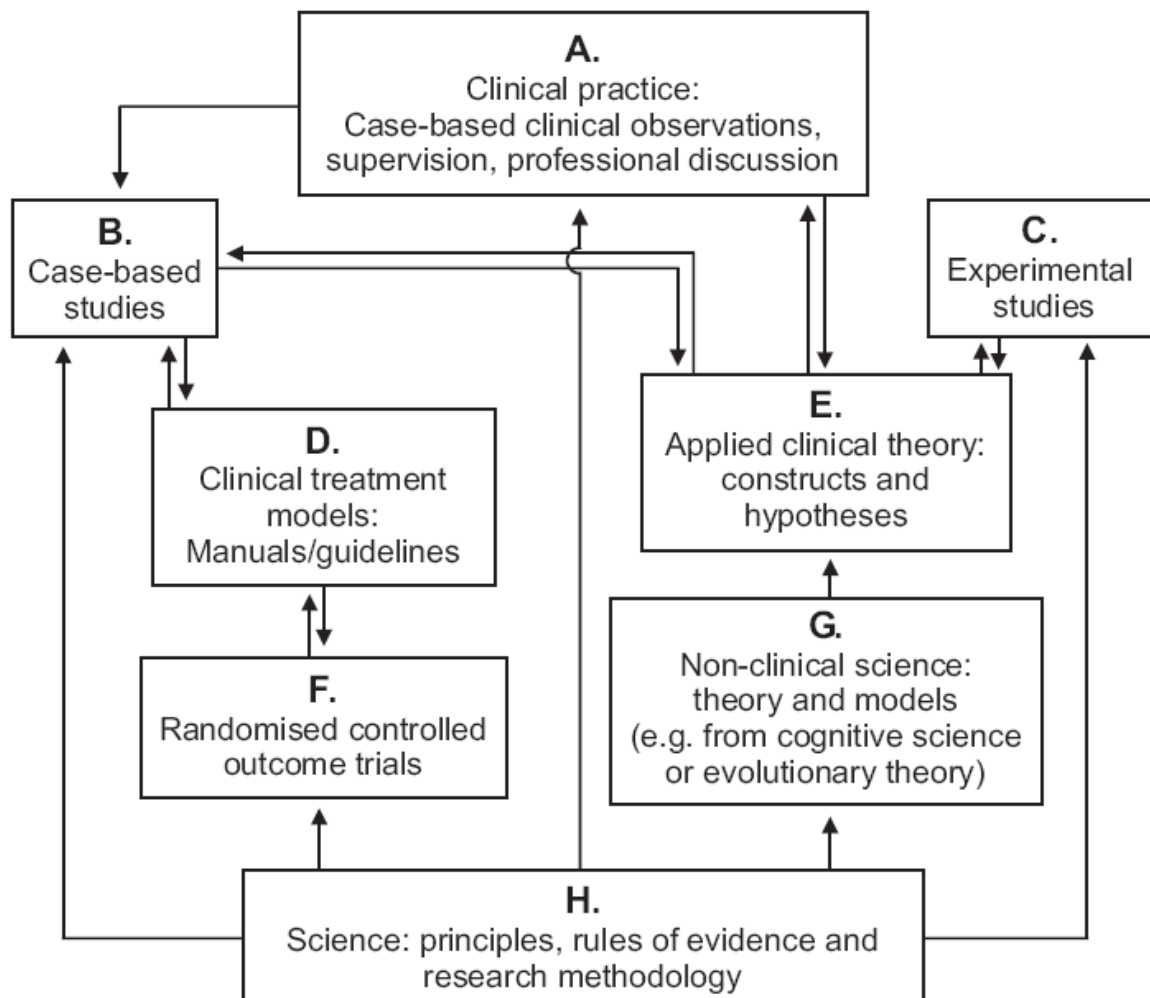


Figure 1: The role of clinical research activities in the development of clinical theory and treatment models in cognitive therapy.  
(Modified from Salkovskis, 2000 and Edwards, Henwood and Kannan, 2003)