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Medical adjustment counseling: An evidence-based neuropsychological approach in the care of medical patients

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Abstract.
BACKGROUND: Today, there exists a need for a practical counseling approach for patients with brain disorders based on an empirical measure that can be used to objectify procedural adequacy. Clinical neuropsychology, which focuses on developing knowledge about human brain-behavioral relationships and applying this information to clinical problems, is the ideal discipline to address this issue. Unlike other methods of appraisal and current counseling approaches, medical adjustment counseling (MAC) for patients with cognitive and behavioral changes due to brain disorders is based on the application of neuropsychological principles and evidence-based practices.
OBJECTIVE: In this review, I discuss the neuropsychological principles underlying MAC, differentiation from conventional clinical psychology systems, and the specifics of the treatment stages. Transtheoretical analytic points of inclusion and a clinical case example are also discussed.
METHODOLOGY: MAC involves an interactive exchange between the neuropsychologist and patient based on the neuropsychological examination (NPE). The resulting neuropsychological profile facilitates the conversion of empirical objective evidence into practical biopsychosocial adaptive strategies that can be modified according to each patient's diagnosis and level of impairment. MAC is delivered in four stages (validation, education, accommodation, and reintegration) that require an understanding of the ecological applicability of the NPE to the real-life situation of the patient, a knowledge base of the neurobehavioral consequences of the medical diagnosis, integration of medical disciplines regarding additional diagnostics, psychological crisis systems and patient/family reactions.
CONCLUSION: Without the objective neuropsychological evidence provided by the NPE and MAC, the clinical judgment of the psychologist is based on something more akin to witchcraft and magic than science.

Keywords: Medical adjustment counseling, clinical neuropsychology, brain-behavioral relationships, neuropsychological examination, procedural adequacy, rehabilitation

1. Introduction

Current methods of appraisal and approaches to counseling psychological patients with brain disorders are excessively reliant on the patient's symptom reporting and on non-systematically elicited details of case history, interview information, clinical judgment, and occasionally at best, psychological testing. Thus, due to the subjectivity of patient complaints and assessment of their treatment needs, there exists a need for a practical counseling approach for patients with brain disorders based on an empirical measure that can be used to objectify procedural adequacy. Medical adjustment counseling (MAC) represents the

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development of a model of adaptive strategies to treat cognitive and behavioral deficits in medical patients through the application of neuropsychological principles and evidence-based methods. MAC is based on the conversion of objectively derived empirical neuropsychological data into practical biopsychosocial strategies for the treatment of such patients. This approach allows redirection of the patient with limited understanding of the neuropsychological condition or its functional daily expression and converts misguided aspirations into realistic goals and directions. Furthermore, MAC is an optimal choice for patients averse to the perceived stigma associated with the label "psychotherapy".

MAC is based on the neuropsychological profile of each patient obtained by neuropsychological examination (NPE). This provides an evidence-based "blueprint" for treatment and a clinical pathway to understanding the nature of the patient's cognitive and behavioral changes and additional rehabilitative needs.

MAC is delivered in four stages (validation, education, accommodation, and reintegration) that require an understanding of the ecological applicability of the NPE to the real-life situation of the patient, a knowledge base of the neurobehavioral consequences of the medical diagnosis, integration of medical disciplines regarding additional diagnostics, psychological crisis systems and patient/family reactions. Without objective neuropsychological evidence, the clinical judgment of the psychologist is based on something more akin to witchcraft and magic than science.

Here, I discuss the neuropsychological principles underlying MAC, differentiation from conventional clinical psychology systems, and the specifics of the treatment stages. Transtheoretical analytic points of inclusion and a clinical case example are also discussed.

2. The scientific basis of MAC and the NPE

The scientific method has been phenomenally successful. In the 400+ years since its inception, it has provided a route out of poverty and disease into a world of longevity, abundance and leisure (Walker, 1963). Although the scientific method has been applied successfully in the field of psychology, psychologists can be limited by the subjective nature of measurements used to arrive at conclusions. In fact, some do not hypothesize about how nature works, but rather, how it ought to work (Sica, 2017).

Few clinicians will deny that there is some substance in Osler's dictum that: "Medicine is a science of uncertainty and an art of probability" (Bean, 1950), and by extension, this quote applies to psychology. In this respect, we must distinguish intrinsic and extrinsic categories of uncertainty. Intrinsic uncertainties are those pertaining to the imprecision, ambiguity or other limitation of the information or data on which clinical judgments are based. Extrinsic uncertainties often misleadingly called "observer error", make their appearance in clinical judgments based on a set of data (Lusted, 1968). This variation in the clinical interpretation among psychologists is affected by factors such as professional experience and psychological conditional probabilities. Today, in attempts to computerize diagnosis, efforts have been made to replace subjective interpretations by recorded indices and other data. However, whether, and to what extent, a computerized system can simulate the intuitive assessments of an experienced clinician remains a subject for debate. Furthermore, the effectiveness of psychological treatment depends, among other things, on an understanding of the manner in which the patient interprets information concerning their diagnosis.

Both the patient and psychologist are subject to various types and levels of uncertainty. The psychologist must have a minimum degree of belief in their diagnosis to justify their use of a particular therapy. Similarly, the patient requires a minimum degree of understanding about how they lapsed from health before treatment. In both cases, there are three distinct thresholds of certainty for both the psychologist and their patient. First, there is the information threshold defined as the minimum information required to interpret the situation. Second, given the requisite information, there is the psychological probability threshold. This reflects the understanding regarding the degree to which the patient's daily adaptive functioning is compromised. Third, given adequate intake information and an understanding of the patient's deficits, there is the action threshold, which defines the level of inertia that must be overcome before action can be taken. This depends on the motivation of the patient relative to the process of information delivery by the psychologist. Many a decision about behavioral health is made and treatment rendered with uncertainty or incomplete knowledge, in which case neither a decision nor action is taken. This applies both to psychologists and to patients

and requires an understanding of how statistical conclusions are interpreted, how information-gaps are bridged and what distortions enter into their respective evaluations (Schoenberg et al., 2018). The proper interpretation of these uncertainties is essential for effective doctor-patient communication and treatment. It is noteworthy that, in spite of the great advances in medical science, "fringe" medicine flourishes in the United States along with a variety of psychological theoretical systems that are misapplied in medical patients.

The different forms of uncertainty that enter into questions of behavioral health can easily lead to error and misjudgement regarding the nature of the patient's deficits. Thus, an empirical and evidence-based method of assessing procedural adequacy is required to ensure effective treatment of patients with brain disorders. A number of approaches are used to assess procedural adequacy, including research, making observations that are relevant to the diagnosis, the analysis of the neuropsychological facts and "making sense" of the data in terms of their ecological validity or in other words, the way in which the data reflect the individual patient and their particular situation. Finally, procedural adequacy involves communicating results and conclusions to patients; it is the shortfall in this activity, more than any other, that gives psychologists their reputation for being obscure and difficult to understand (Schoenberg et al., 2018). These approach options have widespread application outside the field of psychology. What distinguishes procedural adequacy in this respect from physical or biological inquiry, is not the types of activity as such, but the subject matter on which the process is based. Treatment delivered by a psychologist without careful consideration of how these methods interact with the patient's understanding of their situation frequently leads to meaningless or ambiguous outcomes. Conversely, the clinical judgment of some psychologists is dictated by dogma without re-evaluation of methodologies, assumptions and the value of data aggregation, without accounting for the importance of circumstances such as time and place. Many psychologists make inappropriate inferences and predictions based on a narrow band of observed data, be it the intake process, medical records, or additional data taken from a wider phenomenon in a complex system. *The Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013) represents the "holy scripture" of psychologists; however, when implemented for the purposes of government funding, lobbyists' influence, or insurance pay-outs, these guidelines protect incomes but can lead to corrupt practices that do not fulfil treatment needs (Borders, 2016).

Perhaps the most significant methodological problem is over-reliance on the peer review process. This perpetuates "groupthink", the cartelization of knowledge, and the compounding of biases, rendering clinical judgment and expert opinion cloistered and restrictive. In such situations, science starts to seem like a walled system built around a small group of elites (many of whom share ideas only with each other), and hubris can take hold (Sica, 2017).

Where observation by the psychologist involves flexible/variable examination conditions, distortions of judgment are especially likely to occur (Russell, 2012). These uncertainties are counteracted by the neuropsychological examination (NPE), which facilitates the conversion of empirical and objective neuropsychological data into practical biopsychosocial strategies for treatment of individual patients. Without this, diagnostic, prognostic, and treatment conclusions are frequently reduced to nothing more than guesswork based on clinical impressions (Reitan, 2000). Thus, the NPE provides a scientific and objective basis for the true evaluation of a deficit observed under properly specified conditions (Sweeney et al., 2007).

MAC is based on the neuropsychological profile of each patient obtained in the NPE. Thus, MAC is an evidence-based method of applying neuropsychological principles to the treatment of patients with brain disorders through objective measurement of their deficits and assessment of the procedural adequacy of their treatment.

3. Clinical neuropsychology: A unique discipline for treating cognitive and behavioral brain disorders

Many of the critical issues in psychology can be traced to the mind-body dichotomy in the healthcare system, and the discipline itself. This dichotomy has hindered patient access to relevant services. First, physician training has been dominated by a biomedical versus biopsychosocial model; thus, medication is often viewed as the treatment of choice. Also, medical school curricula include psychiatry and mental health as core components, but often lack integration of behavior and health. Second, physicians are

often hesitant to refer patients for psychological services unless significant psychopathology exists because patients are offended by the suggestion that psychological services are relevant when they view their problem as primarily medical.

Historically, psychology has been regarded as a "mental health profession". The result of this dichotomy is that most psychologists have been trained primarily as mental health service providers. An increased focus on respecialization and standards of practice in psychology are required to treat medical patients. To increase the availability of psychologists with the skills to practice neuropsychology, medicine and clinical practice must be included in education and training. The scientist-practitioner model has resulted in both the advancement of knowledge and the expansion of practice into clinical neuropsychology (Rozensky, 2014). There are important differences between the clinical researcher and clinical practitioner. The clinical researcher's allegiance is to data and hypothesis testing; they spend little or no time with patients. In contrast, clinical practitioners focus on patients who seek help, not just the fraction with highly circumscribed problems who meet specific study criteria. Researchers need clinicians for the rich empirical and observational data they can provide. Clinicians need researchers to help counter a professional culture in which cult-like deference to seniority and authority too often takes precedence over evidence.

To counter this problem, the American Psychological Association Task Force (2006) defined evidence-based practice in psychology (EBPP) as "the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences" (Levant, 2005). In a qualitative analysis of 25 psychologist interviews in private practice regarding their focus and treatment decision-making, the psychologists reported that diagnostic impressions were formulated through unstructured assessment rather than validated instruments and that treatment determination was based on their perceptions of the treatments' match with patient characteristics. The clinicians rarely mentioned utilization of research evidence for assessment or treatment selection in practice (Stewart, Chambless & Stirman, 2018). These problems of relying solely on clinical judgment and experience have been well documented (Lilienfeld et al., 2013). This approach can harm patients by not relying on empirical guidance (Shimokawa, Lambert & Smart, 2010) and missing crucial information that can lead to different conclusions regarding treatment strategies. An accurate diagnosis is an implicit prerequisite for engaging in evidence-based practice (EBP) in which treatments are largely organized by specific disorders (Stewart, Chambless & Stirman, 2018). For example, the current use of the ubiquitous questionnaire for diagnosis of concussion (Broglio et al., 2018) and ADD (Emser et al., 2018) may be sensitive to features of these conditions but are not specific to the individual patient Also, many now claim that the success of treatment outcome is defined by specific symptom reduction requires objectification by psychometric measurement. This change highlights the shift from clinical psychology to clinical neuropsychology in treating medical patients with cognitive deficits.

The field of neuropsychology is now seen as a healthcare profession through evolving modifications to the healthcare delivery system in the United States as prescribed by the Affordable Care Act (ACA; Public law No: 111–148, March 23, 2010). Clinical, experimental and behavioral neurology, which comprise the three sub-fields of neuropsychology, are concerned with brain-behavior relations; however, these disciplines differ in objectives and methods. Experimental neuropsychology focuses on research orientation, group characteristics, and general conclusions about measures of a particular neuropsychological function using a serial approach to assessment. Clinical neuropsychology focuses on brain-behavior relationships and applies this knowledge to clinical problems (Reitan, 1966), based on clinical orientation, patient characteristics and conclusions, measures of integrative neuropsychological functions, personal capabilities, and an integrated approach to examination (Reitan & Wolfson, 1993). Behavioral neurology focuses upon the pathology of the nervous system in terms of brain-behavior studies (Meier,1997).

4. Differences between clinical psychology and clinical neuropsychology in the care of medical patients

There are conceptual and operational differences in the approach, examination, and treatment of brain disorders between clinical psychology and clinical neuropsychology. The major difference between the two approaches resides in the degree of emphasis placed on brain-related manifestations of behavior. Examination procedures in neuropsychology,

documented by careful research, have a known relationship and dependence on brain functions, whereas in clinical psychology, the biological bases of behavior are not of immediate concern. Therefore, the unique distinguishing characteristic of clinical neuropsychology is the emphasis on the neurological basis of behavior and how it relates to brain structure, function, and psychological adjustment with treatment that is designed to meet both the specific and overall needs of each patient. A therapeutic approach that centers only on specific deficits, neglecting the more general characteristics of cognitive impairment, is likely to be grossly inadequate. For instance, speech therapy may improve some aspects of dysphasic manifestations, but the patient may be significantly impaired in abstraction, reasoning, and concept formation abilities that it is impossible to reach normal functional levels much less provide a psychotherapeutic approach that is viable.

Clinical neuropsychology has gained recognition in matters concerning cognitive brain functions of patients. Our methods of examination have provided results that demonstrate both sensitivity and specificity to types and location of damage in making recommendations for treatment planning. Examination batteries, for example, the Halstead–Reitan Neuro-psychological Battery (sensitivity 85.7 and specificity 90.4) and the more recent Meyers Neuropsychological Battery (sensitivity 96.3 and specificity of 90.3) (Russell, 2012), have enabled clinical neuropsychology to be integrated into a variety of medical settings; however, this requires significant inter-cultural skills (Robinson & Baker, 2006; Hoffman & Koocher, 2018) in addition to knowledge of and sensitivity to the culture of the healthcare system. Therefore, in treating medical patients, it is necessary to conform to the environment and culture of the medical setting (Rozensky, 2006). With the increased involvement of neuropsychology in primary care settings and hospital centered Accountable Care Organizations (ACOs; CMS Office of Legislation, 2010; Fisher et al., 2007), neuropsychologists are unmistakably practicing in a patient-centered system. Thus, we must acknowledge that we treat "patients", not "clients". This terminology reflects the critical importance of a system in which patient-centered language is used by our interprofessional healthcare colleagues, physicians and nurses to communicate with referral sources, recognizing that it is patients, not clients and policy makers, who pay for patient care services (Rozensky, 2011).

5. The neuropsychological examination, the foundation of medical adjustment counseling

The recent emphasis on relevance and utility in medicine, and by extension psychotherapy, requires a conceptual model able to capture and describe the workings of natural phenomena (Daubert, 1993). Predictions based on a conceptual model are compared to observations or measurements of actual events in a process that is both dynamic and cumulative. The effectiveness of the model is represented by correspondence between the model itself and predictions of actual phenomena, thereby forming a recurrent validation process.

The only criterion of the scientific method as it applies to psychotherapy, is successful treatment in terms of outcome. Hence, the need for the NPE as an evidence-based method for objective evaluation of individual patient needs and the effectiveness of their treatment. The NPE represents the neurobehavioral description of the patient's brain. The term "neuropsychological" clearly involves both the neurological and psychological components of reference, with the NPE defining the relationship between the biological and behavioral aspects of the brain. The purpose of the NPE is to evaluate each patient's brain rather than their complaints.

Careful specification of adaptive deficits due to a brain disorder is important for diagnosis, management, and treatment. Similar cognitive and behavioral deficits may be due to widely different causes and, therefore, require entirely different psychotherapeutic approaches. For example, a reading disability may be the result of an inadequate learning history in an otherwise normal patient, or a result of a structural anomaly that impairs brain function. Psychotic behavior, including delusions, may be the result of a treatable condition, or essentially untreatable brain changes due to a dementia-related psychosis. Thus, for the purposes of psychotherapy, it is important to determine the cause of the adaptive deficits observed in patients with brain disorders.

Often, the neurological facts are well-known but difficult (if not impossible) for the neurologist, neurosurgeon, or psychiatrist to extrapolate to predictions about the patient's adaptive capacity in his/her environment so as to maximize adjustment.

A complete NPE is reasonably comprehensive with respect to adaptively significant behaviors, whereas other methods of analyzing a patient's adaptive capacity are likely to omit critically important

behaviors. In general, other methods of analysis tend to rely too heavily on a patient's spontaneous verbal behavior during information intake. If we base our clinical judgment on the subjective complaints of the patient, and in turn, resort to tests predicated on what the patient says, this becomes merely an exercise in validating the patient's report.

It is important to recognize that neuropsychological interpretation in relation to neurological findings is not a circular exercise duplicating the initial diagnosis already provided. Its principal purpose is to describe brain-related disorders that fall in the neuropsychological domain rather than neurological domain. The NPE describes the behavioral manifestations of the brain disorder, or to rephrase this in the vernacular, neurologic radiological studies describe the "real estate" in the brain, whereas the NPE characterizes the "inhabitant". The patient's complaints do not provide a valid basis for judging the neurocognitive symptoms that is secondary to the diagnosis. The NPE results provide an objective understanding of the patient's status, both neuropsychologically and psychologically, avoiding the tendency to assume that emotional factors are responsible for a patient's difficulties. Moreover, regarding the integrity of cognitive brain functions, the NPE offers inferences based on behavioral measurements rather than observational evidence leading to the determination of the strategy for psychotherapy.

Effective outcomes are achieved through comprehensive NPE of the patient's cognition and behaviors and careful comparison of their capacity in relation to the demands of the work, home, or school settings to which they will return. With precise knowledge of a patient's neuropsychological profile, specific psychotherapeutic techniques, rehabilitation, and compensatory measures can be applied. If not, organic and prognostic conclusions will be reduced to nothing more than "clinical impressions", which increase the risk of inappropriate and ineffective psychotherapeutic treatment systems.

6. Benefits of the neuropsychological examination as the entry into medical adjustment counseling

Watt and Crowe (2018) recently reviewed the benefits of the NPE as the entry into a plan of neuropsychological care from diagnosis to psychotherapy to rehabilitation and outcome. It provides information about the nature and severity of the cognitive impairment and allows the neuropsychologist to integrate data derived from the patient's interview, background information, formal testing and observation (Bennett, 2001; Braun et al., 2011, Harvey, 2012). The NPE can be distinguished from cognitive screening and testing in terms of goals, user requirements, indications for use, levels of complexity, and anticipated outcomes defined in a statement by the American Psychological Association Practice Organization (2014). There is no substitute for a comprehensive NPE evaluating all cognitive domains for the determination of psychotherapeutic needs regarding efficient daily adaptive functioning. This highly complex process for examining and collecting relevant data for diagnostic and prognostic decision-making (Block et al., 2017) serves not only as the "blueprint" for treatment, but provides secondary benefits to physicians and patients, with the former seeking a confirmation of diagnosis, and the latter reporting the service benefit in regard to understanding the nature of the deficits (Watt & Crowe, 2018).

Finally, the move from psychotherapy to MAC requires communication of the neuropsychological profile to the patient in an understandable manner and facilitates the ability to effect successful adaptive changes. Procedural adequacy involves a continual exchange between the neuropsychologist and the patient in a process of fact-gathering and testing, description of results, and clear explanation of their meaning and implications to the patient. Above all else, procedural adequacy leading into MAC is the final social enterprise aimed at helping patients with brain disorders to overcome their cognitive and behavioral deficits.

7. The basis of medical adjustment counseling

Psychotherapy today is based on a number of systemic approaches. To ensure their effectiveness, it is important to understand the type of patient, the applicability of these approaches for the variety of patients, particularly medical, and the ability of the psychologist or mental health professional to deliver the appropriate care. Psychotherapy can be defined as the treatment of emotional and personality problems and disorders by psychological means. Furthermore, psychotherapeutic approaches can be classified as those in which the goal is to lead the patient to an understanding of the sources of their motivation and provide insight into their therapies, and those that focus on removal of symptoms without concern

for the development of personal insight or characterological changes. Today, the cognitive-behavioral therapies (CBT) have evolved from strict behavior therapy to the contemporary format of cognitive therapy and further, into acceptance and mindfulness cognitive-behavioral therapy (Hayes et al., 2004; Segal et al., 2002). For example, acceptance and commitment therapy (ACT), initially created for anxiety and depression in adults, is now applied to children, adolescents, and couples, for disorders such as body-dissatisfaction, post-traumatic stress disorder (PTSD), eating disorders and a host of other problems. Dialectical behavior therapy (DBT), initially created as an intensive outpatient therapy for personality disorder in chronically suicidal individuals, has been increasingly applied to deliberate self-injury, substance dependence, bipolar disorder and eating disorders (Dimeff & Koerner, 2007). Although the latest cognitive therapies arose from the behavioral tradition, not all cognitive behaviorists are convinced of their effectiveness. Some CBT critics have noted that clinical practices are out of step with outcome data (Corrigan, 2001). ACT, in particular, does not add much to the clinical results of established CBT for the same disorders. Other behaviorists note that ACT is more like a religion than a science, with numerous emotional terms defining behavioral operationalization (Prochaska & Norcross, 2014). These approaches share in the Dodo bird effect that all psychotherapy systems are equivalent because of shared common factors (Wampold, 2001).

The transtheoretical analysis chart published by Prochaska and Norcross (2014) reveals how much psychotherapy systems are consistent with the processes producing change (the how), but inconsistent in terms of the content to be changed (the what) and for the type of patient. Different orientations do not dictate the specific methods used as much as they determine the therapeutic goals to pursue (Beutler, 1983). Definitions of the target problem to be treated and the evidence that represents a successful outcome are critical for successful psychotherapy. MAC, which falls into the consciousness raising and education sections of the transtheoretical analysis chart, is an evidence-based method of applying neuropsychological principles through objective measurement. It is a psycho-biological approach focusing on neuropsychological problems, starting with the NPE and discussed in an ordinary conversation between the neuropsychologist and the patient, paying particular attention to their deficits and psychological reactions to them. MAC does not involve systematic use of the patient-physician relationship of transference to explore the genetic dynamics of the patient's behavior. The neuropsychologist seeks to explain the sequelae undermining the patient's ability to engage in their daily activities without disturbing their relationships with others or creating anxiety. The neuropsychologist's aim is to assist the patient in establishing a more rational and constructive understanding of their situation along with the application of a number of adjustment strategies. Attention is focused more on actual situations and circumstances than attitudes, internal "scripts" and mechanisms.

As an evidence-based system used to obtain a patient's unique neuropsychological profile, the NPE also allows treatment outcomes to also be connected to measurement-based care (MBC) (Lambert et al., 2005; Saggese, 2005; Valenstein et al., 2009). This approach also provides the neuropsychologist with a way to individualize MBC, while allowing continued use of psychometrically valid assessment techniques (Weisz et al., 2011). MBC has been shown to improve clinical outcomes, enhance the formation of collaborative care efforts, facilitate the treatment decision-making processes, and increase patient engagement in therapy.

MAC can be conceptualized as MBC within a framework of EBP applying systematic assessment (the NPE) to decisions related to patient care and treatment in the form of counseling, biofeedback, and cognitive therapy (Scott, 2015). Thus, MAC can be defined as the application of neuropsychological principles and evidence-based methods in the counseling of medical patients through development of adaptive strategies via a four-stage critical pathway of validation, education, accommodation and reintegration.

8. How MAC is distinguished from conventional psychological approaches

MAC emphasizes awareness of the cognitive and behavioral changes and the adjustment strategies necessary to achieve effective treatment. Limited understanding of our deficits, thoughts, actions, and perceptions, minimizes the control we have over our daily lives and results in adherence to detrimental patterns of behavior. Relief from the symptoms of these deficits lies in incorporating an understanding of what is "manifested" in the symptoms into adaptation practices. In fact, even when the focus of treatment is a general increase in patient contentment,

power, freedom, and happiness, an understanding of the conversion/generalization of their diagnosis into their daily adaptive functioning related to their symptoms is critical.

MAC is a rational and accessible process driven by facts and logic that counter the flood of abstract, even bizarre hypotheses that can clutter and confuse the patient. Neuropsychological facts are not only external, but include the patient's emotions, reactions and perceptions. The success of MAC is based on a dialogue whereby the neuropsychologist presents the NPE data and offers answers and analysis in response to the patient's questions. As with other types of conventional psychological approaches, such as brief cognitive therapy and CBT, or variations of these approaches, it is vitally important the patient understands their condition and the practical strategies involved in their treatment. Medical patients present with a different set of adjustment needs that extend beyond CBT and their prescriptive simplicity in correcting distorted thoughts through the development of coping skills.

The departure of MAC from other psychological treatment systems is the dependence on cognitive brain functions. MAC foundations and related interventions include neuropsychological knowledge of brain-behavior relationships, the NPE "blueprint", the nature of neurological diagnoses and recovery, cognitive remediation, and crisis counseling theory. These are not conventional mental health patients, but individuals who have incurred an acute or chronic medical condition. What must come first, however, is an understanding of the nature of the patient's neuropsychodiagnostics and consequential changes. Treatment must be understood in the context of organic changes in the patient's behavior and cognition since this can limit their ability to participate in therapy and effect change (Judd, 1999).

Brain disorders often result in physical, psychological and neuropsychological phenomena that can also be misinterpreted as psychological problems. Therefore, effective treatment requires an integration of various interventions that go beyond conventional psychotherapy systems; these include environmental manipulation, individual/family therapy systems, group/support groups, legal advocacy, community reintegration and educational mainstreaming (Judd, 1999).

MAC differs from traditional psychotherapy in its crisis perspective and comprehensive emphasis on the diagnostic issues, the necessary adaptive strategies to be applied, and how to return the patient to their area of daily functioning. The adaptive strategies focus on the changes in cognition and behavior consequential to the medical diagnosis. Thus, MAC represents the coordination of a more comprehensive and integrated approach known as neuropsychological care (Sica, 2008).

Some aspects of MAC are also derived from principles of medical crisis counseling (Pollin & Golant, 1994; Pollin, 1995). Formerly, the common theme in treatment was the goal of restoring previous levels of functioning by addressing and resolving secondary emotional difficulties. Intervention focused on restoring patients in some clinical populations to their previous level of functioning; however, this is not a realistic goal for many patients with a medical diagnosis in that this aim denies the life-changing nature of the medical crises. In such cases, the patient must come to terms with a new understanding of what constituted normalcy for them. Medical crisis intervention took a different approach seeking to help the patient optimize functioning socially and occupationally while managing the medical aspects of the disease. However, patients with brain disorders are affected by additional factors consisting of the neuropsychological features of neurocognitive impairments, neurobehavioral changes relative to the patient's prior functioning style and their present status in relation to the diagnosis, as well as other medical factors consisting of sensory and motor impairments.

9. How the MAC process works

The most basic and effective neuropsychological treatment is immediate intervention via information and education about the diagnosis for both the patient and family. Such intervention does not immediately correct the deficits but is the best course of action for reducing the severity of the psychological reaction. Patients with an understanding of their situation and its consequences are less prone to becoming entangled in psychological dysfunction syndromes. Such patients are also less likely to feel confused, fearful and isolated in their experience if their diagnosis can be explained.

There is no formula for successful treatment; however, comprehensive neuropsychological care beginning with the NPE, which defines the route into MAC, cognitive remediation, biofeedback and stress management, will aid the neuropsychologist in guiding the patient in a positive direction. Build-

ing an effective relationship is critical and achieved through "the hook", which represents the success of the neuropsychologist in establishing the patient's confidence that someone understands their situation at their initial consultation. This support is essential in re-establishing control in their life following the diagnosis. Unlike the experience of many patients in the mental health setting, most medical patients have had little exposure to psychologists. Also, many medical patients are averse to the label "psychotherapy" or the perceived stigma associated with this type of treatment. Furthermore, patients may avoid treatment by the neuropsychologist due to lack of understanding of the differentiation of this field from conventional clinical psychology.

MAC is delivered in four stages: validation, education/explanation, accommodation and reintegration. First, the patient needs to understand the nature of their crisis, and that, in spite of the emotional and behavioral changes, this rarely represents psychopathology. Thus, the patient is supported in coming to terms with their anxiety and depression as normal psychological responses to their situation. It is important to note that these psychological reactions do not warrant the same treatment approach adopted for patients experiencing the same symptoms independent of a medical diagnosis. The patient is then helped to understand that their condition involves a continuum of changes in social, vocational, educational and medical functioning.

The second stage of MAC consists of education, which is the most basic element in the treatment of brain disorders. This stage involves the explanation of the patient's neuropsychological profile in terms of the NPE, which forms the basis for their treatment through MAC, biofeedback, and cognitive rehabilitation. This often engenders in the patient a sense of relief that someone understands the nature of their problems and can treat them accordingly. This explanation marks the starting point of neuropsychological care (Sica, 2008). Traditional psychological evaluation (or its lack thereof) may not only fail to identify the clinical problem, but also misrepresent the nature of the crisis. On the other hand, reviewing the neuropsychological data with the patient and their family can be considered the "gateway" to a successful outcome (Rosado et al., 2018).

The third phase of MAC, accommodation, is the most complex stage in achieving successful adjustment to a medical disorder. Conventional psychotherapy may not only be ineffective, but also counterproductive. A more effective process focuses on the patient's deficits and development of alternate strategies to compensate for these limitations that involve conditioning of new automatic behaviors and the implementation of environmental changes. Such an approach focuses on the variety of cognitive changes and psychological reactions to the disorder since the patient functions in a continuum of social, vocational and educational arenas. Ultimately, successful treatment of brain disorders requires psychological adjustment intervention consisting of an integration of crisis and neuropsychological approaches (Pollack, Kohn & Miller, 1984).

Reintegration is final stage in MAC that consists of successful adaptation to daily functioning as a result of psychological transformation achieved in the prior stages in the recognition, compensation, and adjustment to a new set of limitations. This is the point at which the patient is able to regain a sense of identity, allowing them to build a new life that incorporates the changes in their capacities in daily functioning.

10. Potential limitations of MAC

Given the results of the patient's NPE are used to determine the treatment plan, certain limitations of MAC prevail. The term "neuropsychological" clearly involves both the neurological and psychological points of reference, with the neuropsychological properties establishing the relationship between the biological and the behavioral aspects of the brain. These two areas (initial deficits and recovery potential) are obviously intertwined causing potential cognitive and behavioral problems that undermine the MAC intervention model. Such limiting variables are executive function deficits, cognitively-mediated changes in behavior, changes in emotional communication and reactivity, and the amalgam of combinations of these interactions since it cannot be assumed these areas can be attended to independently. Nonetheless, in cases where the NPE precludes the patient being a candidate for MAC, focusing on the patient's significant other or family regarding stabilizing the environment, establishing a long-term relationship for practical guidance recommendations, and care for the caregiver(s), becomes the treatment goal (Judd, 1999).

11. MAC – a clinical case example and suggestions for patient-centered application

A 60-year-old successful pharmaceutical representative incurred a slip and fall concussion with brief loss of consciousness. She was brought to an ER, where radiological studies were negative, and she was discharged with advice to rest and return if she experienced any changes. Over the next few days the patient experienced headaches, nausea, dizziness, fatigue, anxiety and cognitive changes. She returned to the ER and was referred to a neurologist. She was diagnosed with concussion and told to rest, and that she could gradually resume her daily activities as her condition would resolve over time. Although the patient returned to work, she encountered cognitive and behavioral difficulties. From a neurological perspective she made a normal recovery and over the following weeks she reported modest improvements, despite continued cognitive and behavioral impairment. She was again reassured by the neurologist that she would recover in time.

This may be true for some personality types and certain medical conditions, but not in all cases. The patient continued to experience problems at work and actually deteriorated. She was an overachiever, had high expectations of herself, and a self-image attached to her history of professional success. Being repeatedly told she would be fine and with no visible deficits in neurological tests set in motion a deteriorating dysfunctional scenario (Kay, 1986). This conditioned anxiety was caused by a lack of understanding of the transitory recovery process, much less what adjustment strategies to apply. Consequently, this created a psychological decompensation process whereby the patient felt worse than her actual condition warranted. Daily mistakes, many of which are common in unaffected individuals, were automatically attributed to the effects of her accident. The prominent feature of this type of dysfunctional syndrome was the anxiety associated with being "off" in her daily performance in all social spheres. Patients with this profile, whose self-image is attached to overachievement or who have not developed a resilient sense of self, are particularly vulnerable.

The patient was referred to this examiner as a "psych case" and the first of the four stages of MAC was applied during her neuropsychological consultation (validation). The baseline NPE results were consistent with a resolving concussion with significant psychological overlay. This was explained to the patient in a follow-up office visit (education/explanation) and a course of treatment consisting of MAC, biofeedback, videotaping and cognitive therapy was recommended. In the third stage (accommodation), the patient was provided with strategies for adjustments in daily functioning based on an understanding of the nature of her deficits, along with biofeedback for anxiety control and its undermining effect on cognition. Finally, the rehabilitation plan was completed with some cognitive exercises in conjunction with simultaneous biofeedback assuring the patient of intact cognition. With the appropriate strategies and understanding, the patient gradually returned to work (reintegration) after a few weeks. There were no residual issues and the patient achieved an excellent recovery. For this type of successful outcome, treatment requires a formal intensive program to guide the process. MAC is the entry into the larger process of neuropsychological care (Sica, 2008). To think it can be mandated by conventional psychotherapeutic systems or reassurances is to vastly underestimate the complexity of the brain.

Finally, some suggestions in dealing with medical patients. Always bear in mind that the patient's impression is critically influenced not only by how you look, but also by what you say. It is vital that your communication is clear and understandable to the patient, with limited technical terms and no jargon. Introduce yourself to the patient and their family and address the patient as "Sir" or "Madam" or, with their permission, use the patient's given name. Partner with the medical community in treating the patient using an interdisciplinary care package and ensure that the patient and their family understand this treatment plan. Set and manage patient expectations. Review your plan after each office visit and ask the patient if they have questions. Engage others who may impact the patient's perceptions, such as the spouse or extended family. Finally, inquire about the patient's level of satisfaction with their treatment and whether they need additional support from you or with adjunctive medical care.

12. Conclusion

MAC is related to medical crisis principles (Shapiro & Koocher, 1996) and is a practical approach to treating cognitive and behavioral deficits in medical patients. To achieve the goals of MAC, the neuropsychologist may choose from an array of intervention strategies and techniques that are available

in achieving the goals of MAC, including individual/family MAC, biofeedback, videotaping, crisis intervention, stress management, cognitive rehabilitation, and medical options. Medical patients are more interested in short-term, focused interventions that can facilitate their recovery, than in long-term, insight-oriented therapies (Carmin, Robinson Kurpius, & Roth–Roemer, 1998). The NPE provides the gateway for the application of these interventional strategies through the transformation of theory into appropriate methods in clinical practice.

Neuropsychologists must be cautious when selecting a strategy, as they have to take into consideration issues such as the effectiveness of the strategy, possible interference with the patient's medical treatments, the cost/effectiveness ratio, and time limits. Although behavioral health is of great importance for all medical patients in their adjustments in quality-of-life, the approaches of a mental health professional are different from those of a neuropsychologist. For instance, a mental health professional focuses on psychosocial issues and their association with behavior. In contrast, the neuropsychologist focuses primarily on the integrity of cognitive brain systems and their mediation on lifestyle in addition to the psychological health issues, even when no mental health difficulty is present.

As society and healthcare policymakers become more familiarized with the biopsychosocial perspective on health and brain disorders, and appreciation of the neuropsychologist's role in medical settings increases, the opportunity for applying MAC in healthcare services will grow. Neuropsychologists are now an integral part of healthcare provision and, more importantly, patients will benefit from their presence and services. However, for a successful integration to take place, neuropsychologists must be properly educated in providing the appropriate theoretical systems to the medical population. It is a challenge for training programs in neuropsychology to satisfy these emerging needs and make the necessary changes in our conceptual delivery of services. Nevertheless, with continuing education and increased advocacy for integrated healthcare services, neuropsychologists will meet their goals in providing improved services.

Besides the existing opportunities and difficulties, clinical neuropsychology is a field with a great future. Healthcare will be faced with a number of challenges in the near future. Changes in education and training, research and practice are already taking place. Within this context, clinical neuropsychology and strategies such as MAC have a lot to offer to the medical patient and the healthcare delivery system.

Conflict of interest

No conflict of interest was reported by the author.

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