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Considering Course and Treatment in Rehabilitation: Sequential and Dynamic Causality

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In this chapter, we expand the chronic pain model presented by Gatchel (Gatchel, 1991; Gatchel & Kishino, 2006) and apply related principles to the general rehabilitation context. Our model is presented in general enough terms to apply not only to chronic pain, but also to traumatic brain injury (TBI), and Posttraumatic Stress Disorder (PTSD), covering the major psychological injury and rehabilitation conditions. The model permits understanding of individual differences in rehabilitation patients relative to the unfolding recovery process, may help guide the course of treatment, and may facilitate maximal treatment adherence. The model is comprehensive and multifactorial, describing interactions between the "precipitating event," which may be a trauma or illness/disease, and the broad range of processes that shape the recovery process.

In addition to considering functional outcome, recovery is viewed as a psychological state cumulatively representing individuals' attitude toward recovery, their strategy for coping, and the manner in which coping is implemented. We term such an outcome the "subjective recovery strategy." We postulate that individuals in rehabilitation are governed by this evolving process. It reflects a complex interplay of emotional, behavioral, and cognitive-perceptual variables in conjunction with the influence of environmental and incidental factors. The model emphasizes that individuals' reactions to a precipitating event, be it injury or illness, are best conceived in terms of sequential and dynamic causality. The former is characterized by a typical stepwise process, or stages through which individuals pass, and the latter by additional synergistic processes associated with internal and external factors over which individuals have various degrees of control, and which varies with the state of their recovery. Such a model provides a conceptual framework whereby corresponding assessment tools can effectively monitor the change in individuals' recovery status over time, and guide intervention accordingly.
Models of Course of Recovery in Pain and Related Clinical Conditions

In this section, we review standard models of the course of chronic pain, TBI, PTSD, the major clinical conditions of psychological injury. By definition, chronic Pain Disorder speaks to the cessation of recovery, or its absence, from a discrete acute pain episode. Gatchel’s model (1991; Gatchel & Kishino, 2006) provides a description of the sequentially occurring stages leading from acute to chronic pain. According to Gatchel’s model, at the initial stage, which typically extends from 2 to 4 months, there are normal emotional reactions associated with pain, such as fear, anxiety, and worry but, if the pain persists, the second stage develops, which is associated with a broader range of behavioral and psychological reactions. These reactions manifest as learned helplessness, distress, anger, and somatization, which are secondary responses to the newly developing, more chronic nature of pain.

In Gatchel’s model, if the pain continues, in the third stage, the person’s life begins to be consumed by pain, causing habituation and resignation to the pain, reflected in adopting a “sick role.” The chronic pain patient eventually relinquishes normal responsibilities and social obligations and, in the perception of the patient, this role may become a secondary gain of not being healthy.

According to Gatchel’s conceptualization, the way in which pain patients respond to their prolonged pain is influenced by their premorbid or preexisting personality/psychological characteristics (which provides a habitual way of responding to stressful situations) as by their current socioeconomic and environmental factors. By acknowledging the importance of preexisting factors, this model is referred to as a diathesis/stress model, whereby the stress of coping with chronic pain exacerbates individuals’ preexisting characteristics (diathesis).

In reviewing the diathesis/stress model, Turk (2002) stated that the impact of an initiating event is more likely to contribute to disability in people who interpret symptoms as indicative of serious problems, are preoccupied with bodily processes, respond with fear to the perceived symptoms, and also believe that the way to prevent exacerbation of pain and possibly further physical damage is to avoid activities that increase their pain.

Dersh, Polatin, and Gatchel (2002) concluded that the diathesis-stress model has received the most support for explaining the development of depressive disorder and personality disorder in the context of chronic pain. According to them, less evidence has accumulated for explaining the development of anxiety disorders, substance abuse, and somatoform disorders (other than pain) in relation to chronic pain.

With respect to TBI, Mateo and Glod (2003) also described three stages through which severely brain-traumatized patients pass during the recovery process. In the first stage, TBI patients do not have much insight into their condition and overestimate their abilities. In the second stage, such patients have more insight, but this has a negative consequence in the way of greater levels of depression, anxiety, and low self-esteem. In the third stage, TBI patients exhibit levels of distress that depend on their state of recovery.
Gatchel's (1991) chronic pain model has both interesting differences from and similarities to Mateo and Glod's TBI model. According to Mateo and Glod, in the first stage, lack of awareness in severely brain-traumatized patients prevents them from developing concerns and worries about their physical condition, resulting in an overestimation of their capacities. Increased awareness would make it possible to acknowledge their impaired functioning in the broader context of the impact on the self, on their overall life situation, and on remembered pretraumatic abilities. As a result, severely impacted TBI patients, at first, do not become depressed, anxious, or develop low self-esteem. However, as awareness of their difficulties increase, the reaction of TBI patients, in the second phase of dealing with their injury, is quite similar to the one described by Gatchel for chronic pain.

The final stage in the evolution of TBI patients' response to their injury, as described by Mateo and Glod, is similar to what is described by Gatchel's (1991) model, in that a severely brain-injured person may develop a sense of serious disability, habituation to her or his limitations, and resignation to her or his losses and that recovery to the pretraumatic level is not possible. Eventually, severe TBI patients find that their condition provides at least some sense of comfort, in that they are excused from various social and other responsibilities. Mood fluctuations will occur, depending on whether they act from the perspective of an unacceptable sense of loss or with respect to acceptance of their perceived situation.

Mateo and Glod's (2003) emphasis on regained awareness of psychosocial issues as a source of negative emotional dynamics in TBI cases is congruent with the notion that the nature of a patient's conceptualization of her or his own condition and overall situation (schemas), together with her or his coping abilities, are factors that influence posttraumatic adjustment. In this regard, often in rehabilitation therapy, efforts to modify an individual's schemas and coping abilities become the major objects of intervention.

Mateo and Glod (2003) stipulate that treatment should flexibly respond to the changing cognitive, psychological, and behavioral needs of the patient, and to the changing educational needs of the caregivers. When treatment is appropriately targeted to the patient's and to the caregivers' needs, the recovery process is more rapid and complete.

In the context of PTSD, whereas the most common course is that of relatively immediate onset followed by gradual improvement in symptomatology over time, alternate courses, including delayed onset and a worsening course, have been documented (see Chapter 5 by Young, this book). A worsening PTSD course has been associated with initial bad dreams, physiological responses to reminders of the trauma, panic and avoidance, anger at time of trauma, negative interpretations to recollections, and numbing and dissociative symptoms (e.g., Ehlers, Mayou, & Bryant, 1998). A study by Bryant and Harvey (2002) supported the idea that delayed-onset PTSD may be in some cases due to initial presence of subclinical PTSD features that, with progression of time, further deteriorate to the degree that symptoms meet full diagnostic criteria. As with the case of chronic pain and TBI, the recovery outcomes with regard to PTSD also vary, ranging from full recovery, to less than optimal outcome, to significant disability to even becoming totally disabled.
In all three cases (chronic pain, TBI, PTSD), in order to optimize recovery, the course of intervention must first serve to identify, address, and move beyond barriers that impede the potential recovery from occurring. If the condition stabilizes below the projected optimal level, intervention efforts should turn to addressing barriers, and to the maximization of the individual's coping and functional capacities through the utilization of compensatory strategies, activity/environmental modifications, and accommodative resources, even though the individual still is experiencing lingering symptoms (Mukherjee, Heller, & Alper, 2001).

Adherence to Treatment: Mitigating Losses in the Recovery Process

In presenting evidence to court, forensic psychologists and other mental health professionals need to assess complainants in a comprehensive manner in order to meet evidence requirements demanded by judicial rules and regulations, such as specified in the Daubert trilogy. (See the Section 2 by Kane). This refers not only to careful analysis of the index or precipitating event and its consequences in terms of psychological symptoms, disorders, diagnoses, disabilities, and functional impairments, but also in terms of injured patients' adherence to their treatment regime. A related issue is their motivation to return to their preevent psychological status and daily functional activities, whether at home, at work, or at school, and their subsequent efforts in returning to their primary preevent daily functional activities, for example, in terms of utilizing recommended assisted devices, following a preliminary plan of returning to modified duties, and so on.

For our purposes, with respect to the rehabilitation context, forensic assessors need to carefully evaluate the degree of treatment compliance. Did the patient attend all recommended physical and psychological sessions? Did the clinical notes indicate a constructive attitude and full participation? Barriers to or difficulties with treatment compliance may be iatrogenically created when the interventions are not focused upon the client's primary perceived barriers, and treatment does not address the client's primary rehabilitation objectives, including those of functional role fulfillment and independent living priorities (Salmon, 1998).

Antoniazzi, Celinski, and Alcock (2002) observed a similar phenomenon in their survey of rehabilitation staff and patients. They found that whereas patients undergoing rehabilitation for bodily injuries regarded pain as a very high treatment priority, rehabilitation staff did not perceive reduction of pain to be an equally important goal. In a similar vein, Clay and Hopps (2003) emphasized that treatment should be generally congruent with a patient's gender-related lifestyle and with rehabilitation objectives. Patient adherence to treatment is further predicted by social support, motivation, personality, environmental factors, and treatment factors (Chervinsky et al., 1998; Clay & Hopps, 2003; MacMillan, Williams, & Bryant, 2003). According to Chervinsky et al. (1998), motivation and factors that are linked to motivation, such as level of denial, self-awareness, hostility, apathy, expectations, locus of control, values, and knowledge of treatment,
all play a role in treatment adherence. Further patient variables that contribute to treatment adherence include: socioeconomic status, support system, health beliefs and behaviors, self-esteem and self-efficacy, level of adjustment, and depression (Clay & Hopps, 2003). McMillan, Williams, and Bryant (2003) also found that severity of cognitive deficits played a major role in patients’ ability to reflect on their traumatic experience, thereby making treatment adherence more difficult. Contributing environmental characteristics include social support, transportation needs, and access to treatment facilities (Clay & Hopps, 2003). Facilitative treatment characteristics include: minimal treatment side effects, minimal requirement for patient deviation from regular routine, and treatment simplicity and brevity (Clay & Hopps, 2003).

To summarize, treatment adherence factors explain, in part, the variance of recovery across and within individuals over time. Treatment objectives, strategies, and methods must systematically readjust to patients’ emerging or changing needs, and continually reengage them for ongoing maximal treatment compliance to occur.

The next section introduces our interactive model that captures the constructs of both sequential and dynamic causality, viewed as critical factors in the interplay between the evolving clinical course, interventions, and treatment adherence.

Sequential and Dynamic Causality

At any given time, to evaluate patients’ stage and style of recovery, assessing professionals need to determine: whether a person has been responsive to therapy, how much recovery has been achieved, and whether ongoing intervention is justified. To this end, one must take into consideration: the normative success rate for the condition when it is treated; the secondary, tertiary, and incidental interactive factors at play; the individual’s schemas; and individual’s coping style and coping strategies. Consequently, an individual’s subjective recovery strategy evolves with the ongoing impact of therapeutic interventions.

However, psychologists need quantitative indices of the scope of recovery after psychological injury, and such measures are noticeably lacking. Typically, psychologists ask patients how they are doing, perhaps using verbal report according to an 11-point subjective distress scale from 0 to 10, where 10 represents the worst possible psychological condition, or no improvement. We propose that psychologists and other mental health professionals would profit from having more quantitative measures with adequate reliability and validity that can chart patients’ progress after the onset of psychological injury. When response to recovery is graphed in a quantitative manner, using standardized instruments with known reliability and validity parameters, the recovery of the patient is being monitored by a recovery curve. A recovery curve may provide clues about the variables intervening between the initial impact of the index event and the patient’s current psychological state. For instance, a deteriorating course in the face of a minor injury may suggest the potential presence of coexisting physical or emotional pathology,
a lack of adherence/effort in therapy, the working of a misinformed illness etiology schema, or malingering or related symptom amplification processes. (See Section II, this book.)

Through accurate identification of such recovery curves, one can better determine whether the individual's recovery trajectory predominantly reflects an expected course after the type of event that had been experienced, given the person's context and other attributes, secondary or tertiary reactions to trauma, or factors unrelated to the event. By understanding that event-triggered causality represents sequentially unfolding mental states and psychophysiological conditions (that may be causal sources of varied symptoms in their own right), we emphasize not only the causal onset of the condition, but also predisposing and preexisting factors, causal maintenance and evolution, resulting in symptom worsening or exacerbation, and confounding factors, such as possible malingering.

Therefore, we argue that the mental health assessor cannot arrive at a comprehensive understanding of the patient presenting with psychological symptoms after an index event without considering the patient’s recovery curve in rehabilitation up to the point of the assessment. In our view, the concepts of sequential and dynamic causality reflect the recovery process, in which, with the progression of time, the primary reaction to the “precipitating event” may evolve in the context of internal and external factors that, in turn, may become supplementary sources of causation on their own. Our multifactorial model (Figure 9.1) specifies that with the onset of the event, the individual must deal with difficult physical, emotional, and/or cognitive symptoms that alter existing life schemas and interfere with daily functioning. Further changes in initial psychological manifestations may occur as a result of dynamics in secondary and tertiary stages after the initial event. Therefore, the model consists of three phases in the response of patients to

![Figure 9.1. Rehabilitation assessment and intervention process model](image-url)
precipitating factors, along with incidental or unrelated factors. We describe these phases in more detail in the following:

1. Primary Impacts Directly Related to Event. Primary impacts concern direct reactions to bodily injury/illness (such as acute pain or psychophysiological discomfort) or to the threat of substantial bodily harm or personal loss. Primary impacts are comprised of the initial physical, cognitive, and psychological symptoms. Typically, if psychiatric/psychological diagnoses or related mental states apply, they refer to conditions such as acute pain, TBI or mild concussion, Acute Stress Disorder, phobic and more generalized anxiety reactions, dissociation, and Conversion Disorder (Diagnostic and Statistical Manual of Mental Disorders, DSM-IV TR; 1994, 2000). By definition, these conditions would not arise unless the event is perceived as significantly injurious or psychotraumatic to the victim. Studies clearly link PTSD with perceived life threat during the trauma (Elklit, 1997; Ozer, Best, Lipsey, & Weiss, 2003). Ozer et al. (2003), and Malt and Olafsen (1992) noted that there is relatively weak association between the real danger of an event, or severity of an injury, and the appraisal of the gravity of the situation. In the emotional realm, the effects of trauma may occasionally be delayed. In delayed onset, psychotraumatic symptoms may develop through subsequent reappraisal of the event as potentially life threatening.

II. Secondary Impacts/Processes to the Original Event. Secondary impacts reflect sequentially triggered (mal)adjustment response(s) to the primary impacts of an event that may have been injurious. Secondary and tertiary psychological impacts serve to worsen the individual’s condition, by imposing mild to significant affective distress, such as depression, anxiety, and anger/irritability and related symptoms. In the emotional domain, examples of secondary reactions that may be diagnosed include Generalized Anxiety Disorder, Major Depressive Disorder, and the broad category of Adjustment Disorders (in terms of DSM-IV classification criteria). These conditions may not be present, at first, but may appear as products of further processing of the original primary impact and the individual’s ensuing residual physical, emotional, and cognitive symptoms in her or his context. The latter would include her or his psychosocial and therapeutic environment, and pretraumatic vulnerabilities, supports, and coping abilities, including history of traumas and preexisting physical and psychological conditions. These negative developments can be ameliorated to some degree by intervention, with barriers or complications in recovery largely dependent on the characteristics of the individual and her or his context.

For chronic pain, secondary impacts refer to the continuation of acute pain beyond a normative time frame for an injury in question, given the psychosocial context and other characteristics of the individual involved. In the case of TBI, when a concussion is mild, postconcussive effects may last beyond the expected time frame of a few months at most. Even in the absence of an initial primary physical, emotional, or cognitive impairment that reaches diagnostic levels, secondary adjustment responses may be triggered by the index event,
especially in cases of delayed PTSD (or phobia), as mentioned above. Further, if there are initial symptoms as well as delayed ones, it is not uncommon for the secondary effects to form a negative feedback loop by aggravating the primary symptoms, which may, in turn, exacerbate the secondary symptoms in a vicious cycle. An example is that delayed perception of an accident as quite catastrophic will act to increase anxiety and pain sensitivity (Robinson & Riley, 1999), which, in turn, will increase adjustment problems. Melzack (1999) summarized this relation of primary and secondary impacts by stating, "Each kind of stressor can produce physiological effects that are additive with the effects of other stressors" (p. 99).

Moreover, symptom diffusion may occur at this level when a secondary emotional process like Major Depressive Disorder (Dersh et al., 2002) creates altogether new (or additional sources of) physical and/or cognitive symptomatology, such as a sleep disturbance and secondary attentional/memory disturbance, respectively. Secondary processes/factors that have been recognized as constituting sources of disablement in their own right include anxiety, depression, fear of pain, and fear of reinjury (Turk, 2002), psychological distress and pain-related impairments (Turner, Jensen, & Romano, 2000; Turner, Jensen, Warms, & Cardenas, 2002), and the psychosocial environment when, according to Turk and Flor (1999), it "perhaps unwittingly supports the 'pain patient role' [and] can impede alleviation of pain, successful rehabilitation, reduction of disability, and improvement in adjustment" (p. 25).

III. Tertiary and More Remote Reactive Impacts. In the next phase of the sequential model, the patient may experience changes that further worsen or perpetuate her or his physical and psychological condition. Although removed from the secondary reactive impacts, tertiary impacts remain traceable to the original event. Physically, examples of tertiary impacts include the evolution of obesity, high blood pressure, or physical deconditioning/cardiac problems from injury-related inactivity. Psychologically, tertiary impacts include additional emotional distress due to change in psychosocial status, strained family relations, divorce, loss of social contact, termination of employment, and street drug/alcohol abuse as a way of "self medicating." As complicating stressors, they may trigger adverse emotional consequences not initially present that are associated with a deepening sense of helplessness and further functional limitations.

IV. Incidental/Unrelated Factors. There are numerous unrelated events, preexisting or coexisting, which may have an adverse cumulative effect upon the recovery process, including, but not limited to: the death or serious illness of a loved one; unrelated medical conditions; and loss of a job due to employer closure. Their impact often produces an augmentation of disability perception and regression in psychological symptoms (primary or otherwise), particularly by way of increased anxiety and depressive reactions. The difficulty lies in disentangling their effects from ones more directly related to the consequences of the precipitating event, whether primary, secondary, or tertiary. The assessor needs to consider the overall coping ability and resources of the
patient, and how the incidental and unrelated factors have weakened them, contributing to any general inability to handle supplementary stresses. The psychologist should consider that postevent developments in the life of the patient, such as the ones described, may have been handled better had the event in question not occurred therefore, rendering even seemingly unrelated stressors to the event quite related to them through the reduced coping skills and resilience caused by the event.

In sum, secondary and tertiary effects, and other exacerbating factors arising from the precipitating event, often form vicious circles that may contribute to the maintenance and worsening of psychological symptoms, impairments, disorders, or disabilities, if they are not closely monitored and dealt with in the rehabilitation context. The greater the degree of influence of secondary, tertiary, and incidental factors, the greater the prognosis will depart from the expected or uncomplicated recovery curve. In other words, as these factors take on greater influence, there is a departure from the expected prognosis of any given injury or illness, given the characteristics of the original injury, the individual involved, and the context, due to the multifactorial and synergistic processes involved in recovery.

The variables described below refer to other factors to consider in assessing an individual's response to a precipitating event and its subsequent effects (see Figure 9.1).

a. *Premorbid psychosocial, health, and personality status.* Relevant medical and psychological history prior to an illness or injury can significantly affect the recovery process, as can certain preexisting personality traits. Factors such as these act as modifying variables on postevent primary and secondary psychological processes. Dersh et al. (2002) unify these under an overall concept of “diathesis,” defined as “preexisting semidormant characteristics of the individual before the onset of chronic pain that are then activated and exacerbated by the stress of this chronic condition, eventually resulting in diagnosable psychopathology” (p. 773). An equivalent concept in the legal field is the “Thin Skull Rule” (McInnes, 1997), which specifies that any negligent person must take victims as they find them, including their emotional and/or physical vulnerabilities.

b. *Client schemas.* In rehabilitation, schemas refer to cognitive representations, or perceptual fields of reference of relevant life domains, and to attitudes that act to filter and shape behavior in contexts bearing on them. Relevant psychological schemas in rehabilitation include the “existential,” or generalized attitudinal/values schema, and perception of illness schema, concerning the individual's overall context (Dalal & Pande, 1988; Lipowski, 1970, 1981), which research has linked to rehabilitation outcome (KeljtiKangas-Jarvinen, 1986). The coping schema reflects, in part, individuals' long-standing characteristics activated postmorbidly. It includes individuals' sense of self-efficacy (Bandura, 1997) and subjective interpretations that individuals may assign to events that require coping strategies (Groomes & Leahy, 2002). The symptom coping schema refers to how patients perceive their capacity to live with their symptoms and to their perception of overall adaptive potential. Studies have
indicated that certain coping strategies used by rehabilitation clients are particularly instrumental in promoting favorable adaptation and outcomes (i.e., Rosentiel & Keece, 1983), such as finding benefit in adversity by perceiving positive change and personal growth (Tennan & Affleck, 1999), remaining engaged and optimistic rather than passive and pessimistic (Carver & Scheier, 1999), and minimizing or eliminating catastrophizing attitudes that involve a belief that a situation is much worse than it is objectively (Peterson & Moon, 1999). Other schemas include the disability, handicap/participation, and illness schemas, and clients' perception of limiting symptoms/disability, role impacts, and illness etiology.

c. Specific coping abilities, roles, and activity level. This aspect of the model pertains to actual (as opposed to perceptions or schemas of) specific coping skills available and employed in the context of recovery. Aimed toward maximizing rehabilitation activities and premorbid role continuation, these strategies include activity/role modification abilities, pain and stress management skills, pace and persist strategies, emotional coping skills, problem solving skills, role rehearsal, compensatory strategies, and treatment adherence capacities. These approaches redirect the patient's attention to her or his residual resourcefulness and to the goal of enablement vs. disability. They may, in part, mediate the level of functioning achieved in rehabilitation, even in the presence of interfering symptoms and barriers.

To conclude, our sequential processes model (Figure 9.1), depicting the variety of possible steps and influences in an individual's response to injury in precipitating events, is quite congruent with Gatchel's (1991) model of the transition from acute pain to chronic pain. At the same time, it represents an extension of the model, because it is generalized to rehabilitation of various types of other conditions, such as TBI and PTSD. It is also compatible with the diathesis-stress model describing how predisposing factors interact with reactions to precipitating events, possibly setting in motion a cascade of psychological processes leading to disability (Turk, 2002). However, in addition to these regressive possibilities, our model stresses the possibility of more progressive, adaptive outcomes, such as through appropriate therapy, treatment compliance, good coping strategies, and other factors that would optimize the recovery process, producing positive recovery curves. [See chapter 8 for an expansion of Gatchel's three-stage model into a five-stage one.]

Rehabilitation Processes and the Role of Process-Oriented Outcome Measurements

Attempts to assess dynamic rehabilitation processes should be based on knowledge of the typical and optimal recovery course as a benchmark, or frame of reference, against which an individual result can be compared. Much research is needed to specify such outcomes, and one goal of this book is to present the current state of the field on this question.
In accordance with such an approach, Salmon (1998) developed a dynamic measurement system to analyze recovery over time on an individualized basis. For example, in neuropsychological assessment of an elderly person who has sustained mild to moderate brain trauma, the initial neurocognitive profile may suggest a differential diagnosis of brain trauma vs. early progressive dementia. In the absence of clarifying neuroradiological evidence, the differential diagnosis may only be possible through serial investigation of the condition over time; a measured deteriorating course (ruling out the impact of coexisting complications) would be supportive of progressive dementia, whereas improvement over time would be supportive of brain trauma-related pathology. Naturally, in confirmed progressive dementia, one cannot necessarily rule out the possibility that brain trauma had also occurred and may have added to the initial (and ongoing) functional decline. The point is that, in the absence of sequential measurement, relying on static (singular) assessment alone for diagnostic determination may be highly restrictive and misleading. Similarly, a pain patient may be doing quite well adhering to treatment regimen, but may suddenly stop improving and move on to a chronic pain state through the interplay of multiple factors (see Figure 9.1), ones that may even include additional stress generated by supplementary physical injury in physiotherapy or by psychological factors such as heeding solicitous behavior by significant others that encourage adopting a sick role. With respect to delayed PTSD, an assessor may find that once serious physical injuries begin healing, the patient focuses on delayed psychotraumatic reactions.

It is important to recognize that in order to more fully address issues of dynamic rehabilitation processes (and, secondarily, dynamic causality), it is insufficient to measure predominantly diagnosis/symptom-derived outcomes. In accordance with the World Health Organization’s model, rehabilitation of impairments, disability, and restriction of participation, along with functional outcome and role engagement, have become at least equally important areas of measurement (Heinman, 2005; Mermis, 2005). Moreover, a serial assessment approach that fosters a greater understanding of the underlying cognitive and behavioral processes involved has also been endorsed (Mermis, 2005; Turk & Burwinkle, 2005).

Uomoto and Fann (2004) emphasize that the clinical needs of the patient often change during the recovery process due to his or her cognitive style and manner of interpreting the events that caused the injury. Edwards, McNeil, and Greenwood (2003) carried out a study in which inpatient progress was monitored at different times during treatment. Lower functional independence scores were correlated with longer hospital stay; the treatment course also had to be extended for those with lower levels of impairment but greater behavioral and motivational problems. Thus, to ensure that treatment is properly targeted, the patient’s level of motivation, behavioral problems, functional abilities, and levels of impairment/dependency need be continually monitored and reassessed.

Rehabilitation Outcome Management System (ROMS; www.rreccs.com), developed by the present authors (Salmon, 1998; Salmon, 2003a, 2003b; Salmon & Celinski, 2002), is a process-oriented outcome measurement system that serves as a graphically-based rehabilitation, differential diagnostic, and treatment planning
methodology. It is compatible with the currently presented rehabilitation process and dynamic causality model. Given the validity research to date, as works in progress, it is a promising methodology for assessing constructs discussed in this chapter.

The first instrument developed in the ROMS series, as a distinctly rehabilitation-focused measure, is the Rehabilitation Checklist (RCL; Salmon, 1998). As a stand-alone schema-based measure, the RCL may readily supplement a standardized battery of traditional measures. For example, the RCL has the client prioritize her or his rehabilitation barriers. The primary barriers selected will either be consistent or inconsistent with the presenting diagnosis and ensuing limitations, and may reveal adverse schemas. Moreover, the prioritized rehabilitation barriers reflect the most pressing issues for the patient, suggesting that these be addressed therapeutically. After prioritizing the barriers, the patient is next asked to rate her or his perceived limitations across a range of life role domains (participation schema). In subsequent sections of the RCL, the client rates her or his perception of emotional/physical progress over time, projected into the future. The self-rating of rehabilitation barriers should be repeated over the rehabilitation course, because such perceptions may change during the recovery process. For instance, in the acute phase, cognitive or emotional impairments may be deemphasized, because issues pertaining to physical injury, mobility, self-care, communication, and other basic activities of daily life (ADL) are of the highest priority. At the midpoint, emphasis may be on more pressing cognitive and psychological impairments, whereas vocational issues may still be too distant to consider. Should rehabilitation prove successful, as it moves toward discharge, return to vocational or other functional roles may become a priority. Overall, understanding the client’s priorities, and ensuring that treatment aims/modalities are synchronized with them, may enhance treatment compliance. The RCL also allows for the identification of secondary, tertiary, and incidental (including vocational, psychosocial, and secondary gain) factors that may be hindering the rehabilitation course.

Conclusions

In order to understand individuals’ reactions to a precipitating event or illness as they unfold over time, we need to consider the multitude of possible interacting variables and processes, consistent with our sequential, dynamic causality and rehabilitation model. Assessment tools need to be developed that allow for the graphing of individuals’ recovery curves as they pass through the rehabilitation process. When these graphs are reviewed in the context of clients’ physical, emotional, and cognitive symptoms as they evolve in the course of their rehabilitative efforts, and with awareness of any complicating and personal factors, the assessor may obtain a better grasp of the causality underlying individuals’ clinical presentation.

These concepts that we are espousing are contrasted with other simplified attempts to predict outcomes, which rely on less dynamic and unfolding perspectives. The concepts of recovery curves, and sequential and dynamic causality, are
consistent with contemporary literature describing the complex interactions among premorbid vulnerabilities, event or illness factors, postevent stress, various subjective schemas, and coping abilities that shape rehabilitation outcomes. We emphasize the need for evaluative monitoring over time, of the patient in rehabilitation, along with psychological intervention aimed at preventing or ameliorating any secondary and tertiary impairments, and complications from incidental or unrelated stresses. In mental health assessments for court purposes, the assessor needs to address the patient's recovery progression or regression, to help better grasp her or his sequential and dynamic rehabilitation and causality. Forensically, it is imperative that the plaintiff acts upon her or his obligation to mitigate loss following injury. In order to do so effectively and meaningfully, this necessitates that the patient fully cooperates with, participates in, and adheres to an appropriate treatment regimen. At the same time, clinicians are obliged to facilitate optimal treatment adherence, client motivation, and client-centered treatment goal and modality selection. The use of appropriate measurement tools in rehabilitation that effectively graph recovery curves may help monitor these obligations on the part of patients and treating practitioners, helping to verify whether they are being adequately addressed in the framework of the plaintiff's complaints.

Turk and Okifuji (2002), while proposing process-oriented research with respect to pain conditions, stated that, "Little is known about the evolution and changes that accompany pain conditions over time as well as throughout the process of treatment" (p. 685). They added that, "Process research is important not only for observing the evolution of chronic pain syndromes but, also, for learning about the cooccurrence of physical and psychological factors over time" (p. 685). We echo their concerns, and call for the requisite research leading to psychometrically sound instruments that can gauge individual recovery curves sufficiently well for court purposes in all three areas of psychological injury (PTSD, chronic pain, TBI).

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