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Comprehensive rehabilitation for acquired disabilities such as amputation and spinal cord injury are increasingly important as the US population ages and as wounded military service members return home. Persons with disabilities constitute one of the largest minority groups in the USA. Approximately 49.7 million people in the USA live with some type of long-lasting health condition or disability (U.S. Census Bureau, Disability status: 2000. U.S. Department of Commerce, Economics and Statistics Administration, Washington, 2003).

In addition, an estimated 45% of persons in the USA live with a chronic health condition that has some disabling features (Partnerships for Solutions, Chronic conditions: making the case for ongoing care, Johns Hopkins University, Baltimore, 2004). Disability rates increase with age for both men and women, and more than 46% of people with a disability report having more than one disabling condition (U.S. Census Bureau, Disability status: 2000. U.S. Department of Commerce, Economics and Statistics Administration, Washington, 2003).

Keywords
Rehabilitation psychology - Disability - Amputation - Spinal cord injury - Adjustment
Chapter 24
Physical Rehabilitation Programs

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Introduction

Comprehensive rehabilitation for acquired disabilities such as amputation and spinal cord injury are increasingly important as the US population ages and as wounded military service members return home. Persons with disabilities constitute one of the largest minority groups in the USA. Approximately 49.7 million people in the USA live with some type of long-lasting health condition or disability [64]. In addition, an estimated 45% of persons in the USA live with a chronic health condition that has some disabling features [51]. Disability rates increase with age for both men and women, and more than 46% of people with a disability report having more than one disabling condition [64].

In rehabilitation settings, individuals with physical disabilities are typically treated by an interdisciplinary team of health care providers, including physiatrists (physicians specializing in rehabilitation medicine), occupational therapists, speech-language pathologists, physical therapists, nurses, audiologists, vocational counselors, recreational therapists, social workers, and psychologists, depending on the particular setting and the individual’s needs. The team may also include other consulting physicians such as neurologists, orthopedists, psychiatrists, internists, and others [63]. Psychologists practice in a wide variety of inpatient and outpatient settings that serve individuals with disabilities and chronic illnesses. Common settings are public and private acute and postacute care hospitals, other postacute inpatient settings (i.e., skilled nursing facilities and intermediate care facilities), comprehensive outpatient rehabilitation facilities, specialty clinics (e.g., cardiac rehabilitation), and private practice, but also include schools, universities, nonprofit organizations, and state and federal agencies [59]. The Veterans Health
Administration is the single largest employer of psychologists who work with persons who incur SCIs. In hospitals and other institutional practice settings, psychologists almost always work within interdisciplinary teams in rehabilitation units.

In medical settings “physical medicine and rehabilitation” programs involve interdisciplinary team members who collaboratively set goals with patients for tasks related to functional independence, such as ambulation (with or without the use of adaptive equipment), transferring, dressing, and other activities of daily living (ADLs). The branch of professional psychology that specializes in rehabilitation—rehabilitation psychology—has been closely tied to this enterprise, beginning with its inception in the US Department of Veterans Affairs: After World Wars I and II (WWI and WWII), the specialty of rehabilitation psychology evolved in response to the needs of wounded veterans [23]. Rehabilitation psychology draws from several theoretical bases including biopsychosocial theory, behavioralism and learning theory, self-psychology, social psychology, neuropsychology, and cognitive-behavioral theory (CBT; [56]).

Psychologists contribute to the rehabilitation process in a number of ways. Services typically provided by psychologists in these settings can be divided into three broad categories [19]: assessment (e.g., psychological, neuropsychological, and psychosocial), intervention (e.g., counseling/psychotherapy, psychoeducation, behavioral management, family interventions, sexual counseling, cognitive remediation), and consultation (e.g., with interdisciplinary teams, primary caregivers, and/or outside parties and regulatory systems). Psychologists assess the mental health needs of rehabilitation patients. Rehabilitation psychologists possess a specific skill set to assess the differences between normal adjustment reactions in response to acquired disability and a more clinically significant mood or anxiety disorder. Other relevant psychological considerations are concomitant cognitive impairment, substance abuse issues, sexual concerns, pain problems, personality variables, vocational pursuits, and family system topics.

These psychologists also interface with other disciplines on the rehabilitation team and may co-treat or consult about specific issues. For example, a psychologist may be consulted by a physiatrist who is frustrated that a vascular amputee patient refuses smoking cessation, or a psychologist may conduct a joint session with a physical therapist for a patient who has a phobia of movement related to pain. Furthermore, the psychologist in a rehabilitation setting should have knowledge of team and group dynamics in order to assist the team in functioning most effectively, especially in the management of patients with behavioral difficulties or noncompliant behaviors. Psychologists also provide education, support, and evidence-based therapeutic interventions for rehabilitation patients (and, as indicated, for their family members), particularly for those who experience clinically significant adjustment reactions and mental health problems. Elliott and Warren [25] also emphasize that psychologists in rehabilitation settings have unique skills in program development, outcome measurement, and evaluation that are of immense value in a rehabilitation setting.

In this chapter, we will focus on amputee and spinal cord injury rehabilitation settings to illustrate the role of psychology in physical rehabilitation.
Amputation

Acquired amputation of one or more digits or extremities is an increasing health concern in the USA. The most common health concern leading to amputation is type II diabetes mellitus. Vascular-related problems are the leading cause of amputation. As such, prevention efforts and campaigns have become prevalent in medical settings. Planned surgical amputation provides an opportunity for presurgical involvement by an array of providers, including pain management specialists and psychologists who are not available in a traumatic amputation context. In terms of the psychological response to amputation, patients are faced with readjustments based on several factors, including life stages.

Amputation is a diverse disability; amputees vary considerably in the psychological responses observed and in the range of disability experienced [58]. It is important to understand that the majority of amputees make successful adjustments, measured not only on the absence of negative factors but also on the presence of positive factors. A significant subset of amputees, however, experiences significant emotional distress. Psychologists must differentiate a loss or adjustment reaction that is temporary and considered a normal part of the process from a clinically significant depression, which is estimated to occur in 21–35% of amputees [58].

Symptoms of depression and anxiety may appear resolved over the course of rehabilitation but reemerge after discharge [62]. Depression is associated with a variety of psychological factors, and it may be associated with chronic health problems that predate the amputation [66]. Anxiety problems have traditionally been studied less and may be less prevalent among amputees, and there is some evidence that anxiety problems may occur at a higher rate than depression among individuals who are within 5 years post amputation [3]. Traumatic amputation can contribute to the development of post-traumatic stress disorder (PTSD; [45]).

Overall, no significant differences in adjustment have been consistently found as a function of the cause of amputation. Yet it is believed that traumatic onset may increase emotional distress (e.g., polytrauma among wounded veterans). Interestingly, in vascular-related amputations, quality of life (QOL) may improve post amputation as a result of decreased pain and increased mobility. There is a common misconception that more physical impairment leads to poorer psychological adjustment, and that level, location, number, and site of amputations predict psychological adjustment. None of those factors has been empirically linked to adjustment. In one study [26], multiple limb loss was actually associated with higher QOL in veterans compared with single limb loss. Individuals with long-term prosthesis use are at risk for musculoskeletal problems and chronic pain over time [28, 29].

Research suggests that activity restriction related to personal values (activities essential to identity) may be a better predictor, which of course differs among individuals [58]. Time since amputation is not a significant predictor of adjustment in all studies although there is some evidence to suggest that adjustment occurs over time. QOL may improve due to meaning making, new perspectives, reprioritization, and/or increased coping skills, but this is not consistently supported across studies.
With nontraumatic acquired amputations, there may be a sense of initial relief coupled with a delayed-onset grief or loss reaction. In the literature, the initial prosthetic fitting is often discussed as a vulnerable time when unrealistic expectations may lead to disappointment.

**Spinal Cord Injury**

Like amputation, spinal cord injury (SCI) is a diverse disability with a wide range of functional outcomes. Complete lesions to the spinal cord result in total sensory and motor functioning loss below the level of injury; incomplete lesions to the cord typically result in partial sensory or motor functioning loss below the level of injury. Tetraplegia is the result of SCI to the cervical spinal cord, affecting all four limbs; paraplegia results from injury to the thoracic spinal area or below, with greater involvement of the lower extremities in terms of sensory or motor functioning. There are also a number of SCIs that can be classified into specific syndromes (ventral cord syndrome, Brown–Sequard’s syndrome, central cord syndrome, etc.).

More than 80% of individuals who incur a SCI are male; motor vehicle accidents (39.2%), falls (28.3%), and acts of violence (14.6%) are the leading causes of SCI [47].

Depressive symptoms are a relatively common secondary problem following SCI [18, 22]. Arango-Lasprilla et al. [1] found that major depressive disorder is a relatively common occurrence between 1 and 5 years following spinal cord injury, and that several demographic, physical, and psychosocial factors were associated with the incidence of depression. Females who were unemployed, individuals with indwelling catheters, and people with a high school education or less schooling were at the highest risk for depression. Other complicating conditions associated with SCI may be incurred at the time of the injury (e.g., concomitant head injury; neuropathic pain that becomes chronic), or may develop over time due to problems with adherence to therapeutic regimens, disparities in access to care or service provision, social factors, and activity restrictions (e.g., obesity, pressure sores), or as a consequence of the debilitating characteristics of the SCI (e.g., urinary tract infections, spasticity, and contractures) (Warren et al. 2012).

**Models of Disability**

There are several models of disability. The oldest and probably the least frequently (although still existent) used is the moral model. This model, heavily influenced by religious doctrine, postulates that disability is a result of a moral failing or sin on the part of the individual or his or her family members (e.g., parents; [50]). For example, individuals who perceive an acquired disability as punishment for past deeds are conceptualizing disability under the moral model. Following the WWI
and WWII, the medical model was developed in response to disability. The medical model stipulates that physical impairment is a problem in need of a remedy or cure [36]. As a derivative of this, the rehabilitation model assumes that physical impairment is a difficulty that requires rehabilitative efforts to compensate for or to ameliorate limitations.

The social and minority models of disability are more recent developments. These models shift the problem away from the individual and the impairments and focus on the attitudinal, structural, and general environmental barriers, which inhibit those with disabilities from full participation in society. Under these models, disability itself is not viewed as a problem, but rather a neutral characteristic and a natural form of human diversity. Like other demographic characteristics such as race and sexual orientation, disability may even be a valued or celebrated part of one’s identity. However, the social model does not clearly distinguish who qualifies as a person with a disability or how disability is measured or determined [53].

A comprehensive biopsychosocial model integrating the strengths of many of these models of disability is that of the World Health Organization (WHO; the International Classification of Functioning, Disability, and Health, ICF; [67]), developed to address the limitations of the medical model and integrate elements of the social model of disability [53]. The WHO The International Classification of Impairments, Disabilities, and Handicaps (ICIDH) defines “impairment” as a difference in bodily function or structure, “disability” as a limitation in activity or participation restriction, and “handicap” as the interaction between a person with a disability and the environment with limited role fulfillment, which has incorporated the idea of disability as a social construct. As depicted in Fig. 24.1, the most recent ICF retains “impairment” as an alteration in bodily function or structure; importantly though, impairments are no longer defined as problems [53]. WHO ICF defines “activity limitations” as limitation in mobility or self-care. The term

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**Fig. 24.1** The ICF model of functioning, disability, and health
“participation restriction” has replaced “handicap” in terms of life activities and roles such as attending school, gainful employment, or pursuing relationships. The old concept was that handicap resided in the person (“the person is handicapped”), but the new model emphasizes the role of the social and physical environments in restricting or enabling participation (“the person needs accommodations to get to work”). The WHO ICF has added “environmental factors,” which are the external elements which affect the experience of the individual, including technology, attitudes, and services. “Disability” refers to both activity limitations and participation restrictions.

The WHO ICF model applies to a wide range of different disabilities. Sometimes impairment does not result in any functional limitations. An injury may not necessarily lead to impairment. Activity limitations can change based on environmental factors. The dynamic nature of impairments and activity limitations are better reflected in this model than in other conceptualizations.

Adjustment and Quality of Life

Adjustment is often thought of as a point at which an individual reaches and maintains psychosocial equilibrium, achieves a state of reintegration, positively strives to reach life goals, demonstrates positive self-concept, and experiences positive attitudes toward oneself, others, and the disability [43]. Increasingly, these concepts are discussed in rehabilitation psychology as not just the absence of negative factors but the presence of positive ones. However, persons with disabilities must constantly re-adapt to changing circumstances, including life changes, exacerbations of physical disabilities, aging, and interpersonal stressors. Clinically and theoretically, adjustment following acquired disability is best construed as a “…dynamic and fluid process in which characteristics of the person and the injury, their social and interpersonal world…and the historical and temporal context interact to influence physical and psychological health” (Elliott und Rivera 2003; p. 423). A dynamic conceptualization of adjustment (and QOL) following SCI is warranted for several reasons. Individual differences, behavioral factors, and other psychological characteristics usually account for greater variance in the prediction of adjustment among persons with disability than does any condition-specific variable [56]. Stressors appear to vary as a function of psychological and social characteristics rather than being due to specific physical diagnostic conditions [53].

Additionally, it is important to view persons with acquired disabilities as active participants in the adjustment process and to avoid referring to these individuals as “victims” or “sufferers” of trauma or fate [13]. Failure to do so reinforces widely held beliefs that people with disabilities are dependent and incapable of making decisions for themselves, which in turn contributes to objectification [27]. A more appropriate focus may be on disability acceptance, a fluid and dynamic process by which a chronic condition or impairment becomes accepted as a nondevalued part of the individual’s self-concept (e.g., Wright [68]). In Olkin’s [50] description
of disability affirmative psychotherapy, based on the social/minority model of dis-
ability, the disability itself is not a problem, but rather the “problem” resides in
the environmental and attitudinal barriers that impede people with disabilities. The
recognition and integration of personal and environmental factors in adjustment is
a fundamental tenet in rehabilitation psychology [23].

Evidenced-Based Practice

Evidenced-based practice (EBP) in rehabilitation settings is based in a long his-
tory of clinical involvement, interdisciplinary collaborations, and innovative, flex-
ible, yet broad skill sets. Expert practitioners possess competencies espoused by the
American Board of Rehabilitation Psychology (a specialty of the American Board
of Professional Psychology) depicted in Table 24.1 [31]. These competencies typify
informed psychological practice in SCI rehabilitation and with persons with ampu-
tations.

These competencies require a keen awareness of the knowledge base fundamen-
tal to rehabilitation psychology; it also merits a familiarity with the issues associated
with EBP in rehabilitation psychology, generally. The literature base for established
competencies in the core practice areas—assessment, intervention, consultation—
does not follow the linear pattern typically associated with EBP in more traditional
areas of psychological practice. Rehabilitation is an interdisciplinary enterprise.
Therefore, much of the extant literature concerning core competencies appeared in
peer-reviewed outlets that featured studies of interest to an interdisciplinary audi-
ence (and thus out of the mainstream of psychological research; Shontz and Wright
1980). Assessment, for example, has always been a central focus of psychologi-
cal practice in rehabilitation. Historically, important works about psychological as-
essment appeared in journals ranging from the Archives of Physical Medicine and
Rehabilitation and Artificial Limbs to the Journal of Clinical Psychology. Reha-
bilitation psychologists are active in interdisciplinary associations germane to their
practice, research, and policy interests (e.g., the American Congress of Rehabilita-
tion Medicine).

Studies of psychological interventions also follow a circuitous route, shaped in
part by the individualized nature of the rehabilitation process (in which treatments
are tailored to the specific needs and assets of each individual as determined by a
thorough, interdisciplinary assessment) and by the primary focus of the enterprise on
the overall health and functioning of the person (rather than their “mental health”).
Consequently, rehabilitation psychologists traditionally based their interventions on
related areas of research (e.g., CBT for depression) rather than on evidence from
randomized clinical trials of treatments for specific problems (depression) with a
specific clinical population (persons with SCI; [22]).

Typically, rehabilitation psychologists do not subscribe to any single theory of
behavioral change, although most have clear preference for a particular approach
in therapy (cognitive-behavioral vs. psychodynamic, for example). As presented
### Table 24.1 Required and supplemental competencies by the American Board of Rehabilitation Psychology

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<td>Individual therapeutic intervention as it relates to adjustment to disability</td>
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<td>Adjustment to disability: family</td>
<td>Family/couples therapeutic intervention as related to adjustment to disability</td>
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<td>Assessment of extent and nature of disability and preserved abilities</td>
<td>Behavioral management</td>
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<td>Assessment as it relates to educational and/or vocational capacities</td>
<td>Sexual counseling with disabled population(s)</td>
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<td>Social and behavioral functioning assessment</td>
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<td>Individual therapeutic intervention as it relates to adjustment to disability</td>
<td>Improvements in physical functioning</td>
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<td>Family/couples therapeutic intervention as related to adjustment to disability</td>
<td>Integration of assistive technology for enhancement of cognitive, sensory, and physical functioning</td>
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<td>Advance directives/wish to die</td>
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<td>Prevention, e.g., advocacy of legislative policy changes, education</td>
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<td>Establishment of standards of care/practice in rehabilitation</td>
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earlier, there are several models of disability that guide the rehabilitation enterprise, and current practice is quickly embracing the ICF conceptualization. Although this model is not a “psychological” theory per se, it provides considerable opportunities for psychologists to provide meaningful, theory-driven assessments of function, impairment, and capacity, and for prescribing interventions and services to eliminate barriers and promote activity and QOL.

Assessment

Psychological assessment in the rehabilitation setting relies on basic competency in conducting intelligence, cognitive, and personality assessments. It also requires an additional understanding of the unique issues an individual may face following SCI or amputation, and the personal assets, behavioral patterns, and social characteristics known to be associated with optimal adjustment. Usually there is no “standard” battery for use across rehabilitation settings. In inpatient SCI rehabilitation, for example, a routine assessment involves a brief evaluation of cognitive abilities and awareness (with particular attention to the occurrence of loss of consciousness at the time of the injury), distress (including symptoms of depression and anxiety), behavioral patterns (alcohol or other substance abuse; criminal activities), and social characteristics that concern rehabilitation and subsequent return to the community (such as social and family support). These evaluations are often conducted under fairly routine office conditions, but on occasion the psychologist may be compelled to assess a patient at bedside. Certain institutions may require additional measures that serve to monitor progress during rehabilitation and therapeutic outcomes following discharge. This may include specific yet established measures that are widely used (e.g., the PHQ-9; [41]).

Competent practice dictates that psychologists individualize assessments to address unique concerns of the patient. Older individuals with a complex medical history and chronic health problems may evidence cognitive problems following surgery that merit close scrutiny, and, in some cases, additional neuropsychological
evaluation. Similarly, individuals who incur SCI in high-impact accidents often acquire a severe brain injury that may override traditional SCI rehabilitation practice, and necessitate ongoing monitoring of neuropsychological functions. Persons with SCI and amputations are at a risk for neuropathic pain, so psychologists are alert to patients’ reports of pain and displays of pain behavior (such as catastrophizing, sleep disturbance) that may signal a complicated adjustment and ancillary treatments.

Many psychologists may include domain-specific measures of characteristics that have theoretical and clinical importance. Individuals vary in their coping repertoire [58] and in their recognition and use of social problem-solving skills [20]. Research has found coping preferences [38, 39] and problem-solving abilities [14, 17] are predictive of psychological adjustment at discharge and following return to the community among persons with SCI. In a study of elderly amputee veterans in the UK, Desmond and McLachlan [10] investigated various coping strategies of problem solving, social support seeking, and avoidance in relation to general adjustment, social adjustment, and adjustment to limitations. Problem solving and social support seeking were negatively associated with depressive symptoms, while social support seeking was positively associated with social adaptation. Avoidance was associated with depression and anxiety, and poorer adjustment and social adaptation [10]. Other research attests that positive coping efforts [49] and positive appraisal mechanisms [54] are instrumental in optimal adjustment following amputation.

Comprehensive psychological evaluations—that include traditional measures of intellectual abilities and psychological profiles like the Minnesota Multiphasic Personality Inventory-2 (MMPI-2)—are time intensive and may lack immediate relevance to the rehabilitation enterprise. They are, however, recommended for clinical cases in which legal issues concerning liability and culpability are at stake (that can occur following a work-related injury). The traditional psychological assessment can help prepare a psychologist if subpoenaed to participate in the proceedings. In these situations, colleagues are expected to utilize appropriate norms, and to use and report any nonstandardized procedures in scoring or administration.

Rehabilitation psychologists conduct assessments with the intention to identify sources of personal strength and assets that may be integrated to facilitate rehabilitation and adjustment. Current research reveals that many individuals are quite resilient following the onset of SCI (54%), and resilience may be distinguished by high levels of positive affect throughout the inpatient program (Quale and Schanke 2010). In a study following individuals in the first 3 years post injury, resilient individuals endorsed fewer avoidant coping strategies, fewer perceptions of threat, and were more apt to sense a challenge in stress and display a “fighting spirit” than distressed individuals (Bonanno et al. 2012). Unfortunately, this conceptualization of resilience—based on Bonanno’s influential model (Bonanno et al. 2011)—has limited clinical utility for practitioners trying to identify resilient characteristics among individuals in an inpatient setting soon after incurring a disability. Alternative indicators of a trait-like resilient style appear promising. White et al. (2010) studied a self-report measure of resilience among 42 individuals with SCI during inpatient rehabilitation, and found resilience was stable throughout the course of treatment
and it was significantly associated with life satisfaction and depressive symptoms. Examination of resilient traits derived from “Big Five” personality profiles of patients administrated on admission to SCI rehabilitation found resilient persons had less depression at the beginning of the program and greater acceptance of disability and more effective problem-solving strategies at discharge than patients with rigid, inflexible, and overcontrolled personality styles [6].

In all assessment activities, the psychologist must be conscious of the use and availability of psychological data in rehabilitation. As discussed elsewhere in length (Elliott and Umlauf 1995; pp. 327–328), a psychologist in a rehabilitation setting usually has multiple “clients” including the patient and the rehabilitation team. Other parties may also be invested in psychological data and vary in their immediate and eventual access to the data (including insurance companies and research teams). Disclosure of assessment data should always be in the best interest of the client. It is imperative that the client clearly understands these issues, and the psychologist should pursue due diligence in obtaining consent about sharing assessment data, and under what circumstances and to whom the information will be shared.

Interventions

In rehabilitation psychology, blended and individually tailored approaches are often appropriate with a clientele who have more complex medical and psychological needs. Often an individual with a recent SCI or amputation does not perceive a personal “need” for a psychological intervention of any sort for any reason. Indeed, while psychological assessments are quite common (if not routine) in most inpatient rehabilitation settings, psychological interventions are not. Such interventions may be relegated to education or support sessions conducted for inpatients at an assigned time as a routine part of rehabilitation therapies. But psychologists are often in a position to provide individual and couples counseling to support those with recent injuries in the inpatient setting, and sometimes these sessions continue on an outpatient basis following discharge. In other scenarios, psychologists intervene with an individual who has a pronounced alcohol abuse problems, and may employ motivational interviewing techniques in the session. Rehabilitation psychologists also use a variety of techniques, including biofeedback and hypnosis, to help patients find relief from persistent pain sensations. Some interventions may require adaptation for disabilities, such as applied relaxation training for individuals with spinal cord injuries [33].

A few areas warrant particular attention as they address common and emerging areas for practice that often challenge psychologists who are unfamiliar with the field. These include interventions for emotional distress, to promote health and wellness, and for family members of individuals with severe disabilities.

Interventions for depression, distress, and anxiety We know that a significant minority of individuals with acquired disabilities will experience a clinical depression at any point in time. We also know that there are many well-established psychological interventions for depression in the extant literature and in routine practice.
Many of these can be utilized in treating persons with acquired disabilities. Many psychological interventions in the rehabilitation setting theoretically derive from behavioral and learning theories [56] and cognitive-behavioral approaches are often used by rehabilitation psychologists [21].

A recent meta-analysis found that CBT for depression exhibited large effect sizes (and similar effects were found on assertiveness, coping, self-efficacy, and elements of quality of life; Dorstyn et al. 2010). Similarly, another meta-analysis also concluded that there is sufficient evidence to support the use of CBT in treating depression and anxiety post SCI [46]. In both studies, there was ample evidence that CBT had effective short-term benefits, but there is no real evidence for long-term effects. Most of the studies reviewed utilized group formats to provide CBT to participants [12, 37, 40]. Self-management interventions that incorporate CBT principles are effective in promoting emotional adjustment of persons who have experienced limb loss [65].

An alternative model, congruent with a social construal of disability, is disability-affirmative therapy [50]. The framework for therapy centers on disability culture and affirmation of a positive disability identity. Olkin suggests taking this orientation in therapy with individuals with disabilities to provide a culturally sensitive environment that allows for the integration of disability cultural values. Some of the core values include the use of disability humor; acceptance of human diversity; a matter-of-fact acceptance of human vulnerability and interdependence as a natural part of life, skill in managing multiple problems, systems, technology, and assistants; and a flexible, adaptive, or nontraditional approach to tasks [30].

**Promoting health and wellness** Psychologists now participate in programs that emphasize secondary disease prevention and the promotion of health and wellness among individuals with disabilities. For example, women with disabilities (WWD) are at increased risk for preventable secondary conditions; these conditions can influence health status and QOL [8, 34, 48]. WWD are at risk for adverse health behaviors such as physical inactivity, smoking, poor nutrition, and alcohol overuse that are associated with numerous chronic health conditions (e.g., diabetes, obesity, hypertension, etc.), perhaps as a result of environmental barriers to preventative health care and treatment such as decreased physical and economic access and limited social and professional support [4, 35, 55].

Health promotion programs for this population are imperative to wellness [34, 52]. Programs that incorporate cognitive-behavioral principles have been used effectively to promote increased physical activity and increase self-efficacy and perceived control among participants with SCI [42]. Additional training in coping skills and planning can augment these interventions [2].

**Interventions for family members** A significant percentage of family members, including partners and caregivers, develop clinically significant problems with depression and anxiety [7, 11]. Family caregivers of persons with recent-onset SCI can benefit from brief cognitive-behavioral interventions that help them learn effective problem-solving skills [15]. In the most comprehensive demonstration to date, Schulz et al. [60] conducted a randomized controlled trial of two active intervention conditions and an information-only control group for caregivers of
older persons with SCI. The interventions that targeted both the caregiver and the
care recipient resulted in significant decreases in caregiver depression and burden.
Another single-site, randomized clinical trial that utilized long-distance technology
to train family caregivers in problem-solving skills found significant reductions in
caregiver depression over the course of a year, and persons with SCI, with family
caregivers who received the intervention, experienced significant improvements in
social functioning over the 12 months of treatment [16].

Future Directions

The rate of acquired disabilities has increased in the recent years, placing consid-
erable strains on our health care systems for rehabilitation and ongoing care. Com-
bined with the increasing number of persons with chronic health conditions who
have disabling features, the current influx of wounded veterans who return with
an array of acquired disabilities (brain injuries, SCI, limb loss, chronic pain) and
cooccurring PTSD tax practically all health care systems and institutions. To address
the issues presented by wounded veterans, the US Department of Veterans Affairs—
already the largest provider of SCI care and rehabilitation in the world [9]—has
initiated advanced training programs in EBPs such as cognitive processing therapy
and prolonged exposure for PTSD, acceptance and commitment therapy, CBT, and
interpersonal therapy for depression, and CBT for insomnia. Ideally, these will in-
crease the number of skilled psychologists to use these approaches with persons
with acquired disabilities.

In addition, the Department of Veterans Affairs is moving toward patient-
centered care in all VA Medical Centers, partnering with veterans to understand
their values and preferences in order to optimize their health (U.S. Department of
Veterans Affairs 2012). This type of patient–provider partnership is essential to pro-
moting health and well-being over the lifespan among persons with acquired dis-
abilities. It also requires psychologists to actively solicit input from individuals who
live with disability about their needs and preferences, and to provide services that
address the issues identified by these persons.

Given shifting medical reimbursement policies and fiscal challenges, the empha-
sis for rehabilitation is increasingly on outpatient services, with shorter inpatient re-
habilitation stays. Health care services provided in the medical model paradigm are
contingent on third-party reimbursement and the ability of specific programs and
administrative systems to absorb financial losses not covered by third-party payers
[23]. Financial costs associated with chronic and disabling conditions have strained
health care delivery systems grounded in the medical model; cost-containment ef-
forts have often involved cuts in disability services and insurance coverage [53].
Over the past 15 years, there has been a trend for rehabilitation resources to be
reallocating from traditional acute and postacute inpatient settings to outpatient and
home-based programs.
The degree to which these issues will be ameliorated by elements of the Affordable Care Act that are designed to benefit persons with disabilities (and their families) has yet to be realized. However, Elliott and Rath [23] observed that changes in rehabilitation psychology practice are already occurring in response to financial and reimbursement issues, and to the strategic allocation of scarce resources for inpatient rehabilitation. In summary, it appears that inpatient rehabilitation work will increasingly involve the use of psychologists who specialize in practices that are reliably and predictably reimbursed, such as neuropsychology. Psychologists may also develop specialty skills in the use of virtual reality technologies to help individuals in rehabilitation, including novel applications to cope with pain or to enhance their social mobility [32, 61].

Other psychologists, who have broader abilities including therapy, education, and developing community-based services, will likely gravitate to outpatient and even public health institutions in a manner consistent with the ICF model of disablement. Psychologists in these roles will be committed to increasing participation and engagement in desired activities and normative social and personal roles, and to reducing environmental barriers and facilitators of activity and participation for persons with disabilities in the community [44].

To effectively serve this large segment of society, psychologists in these roles may find ways to collaborate and utilize low-cost, nondocotoral-level service providers. This will undoubtedly involve a greater use of long-distance technologies to provide services to individuals in their homes and communities. In some clinical scenarios, supportive and psychoeducational interventions may be provided by psychologists (or staff under their supervision) to families in the home via videoconferencing (cf., [16]). An innovative program now conducted by the Veterans Administration permits staff to perform annual evaluations with veterans in the community. The veterans are seen in a remote, community satellite clinic by a psychologist using videoconferencing technology at medical center. There is preliminary evidence that these technologies are effective [57]. These technologies offer considerable promise in reducing disparities individuals with disabilities currently encounter in access, service, and treatment.

References


34. Hughes RB. Achieving effective health promotion for women with disabilities. Fam Community Health. 2006;29(1S):44S–51S.


AQ2. References no. 5 and 24 are not cited in the text. Please provide text citations for these references or delete the references from the Reference list.

AQ3. Please provide the accessed date for Reference no. 9.