

Rehabilitation

WINTER 2012

2 The Vital Role of Advocacy in PM&R

In this time of health care uncertainty, Bruce M. Gans, M.D., highlights the importance of physicians speaking out for persons with disabilities.

3 Nonpharmacological Approaches to DVT

Stephen F. Levinson, M.D., Ph.D., describes effective strategies as well as treatment pitfalls for a condition that is highly prevalent in the rehabilitation population.

4 Grant Success

Kessler has earned another funding award for SCI research. Steven Kirshblum, M.D., and Trevor Dyson-Hudson, M.D., detail the study and multidisciplinary, comprehensive care that will result.

6 Seizing the Moment

The emphasis on care coordination in implementation of current health care reforms offers opportunities for physiatrists and inpatient rehabilitation hospitals/units, says Bruce M. Gans, M.D.

8 Moving Beyond the Surface

Monique Tremaine, Ph.D., explains how proactive care from mental health experts can help those with acquired brain injury address challenges such as depression and anxiety.

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Wound woes: Prevention and treatment of a common problem

BY BRUCE POMERANZ, M.D., MMM, AND CONCHITA Q. RADER, M.A., R.N., CFCN, CWCN

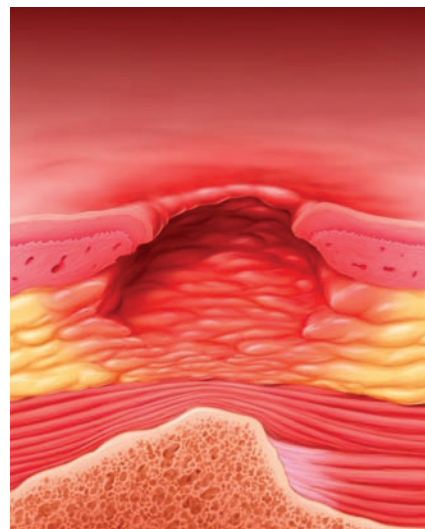
IN 2006 alone, more than 500,000 hospitalized adults had a primary or secondary diagnosis of pressure ulcer (PrU), about one in 25 of whom died. Among survivors, the typical hospital stay averaged nine days longer and cost up to \$25,000 more than that of inpatients without PrUs.

The burden of this preventable injury led the Centers for Medicare and Medicaid Services in 2008 to withdraw reimbursement for expenses related to selected health care-acquired PrUs. Hospitals will be subject to public reporting of this quality indicator starting in October 2012. Thus, inpatient rehabilitation hospitals/units have both clinical and financial incentives to prevent them.

High Prevalence and Incidence

Pressure ulcers are most common in cases of limited mobility or impaired sensation of pain or pressure. Persons with spinal cord injury (SCI), who often have both of these risk factors, face the greatest likelihood of PrUs. In community residents with SCI, up to one in four PrUs may be severe (Stage III or IV). Comorbid conditions increase the already-high risk for rehabilitation patients, particularly when associated with impaired circulation or reduced skin integrity. Diabetes, smoking, peripheral vascular disease, hypertension, steroid use and atherosclerosis are often prevalent, more so in older adults. Malnutrition and inadequate protein intake reduce the body's ability to maintain skin integrity and repair even minor trauma. Poorly fitted shoes, orthotics or prosthetics also can spur development or worsening of PrUs.

Formal, standardized procedures are critical to keep PrUs from occurring. At Kessler



An illustration of the extensive damage to skin layers seen with a pressure ulcer.

Institute for Rehabilitation, the process begins with a comprehensive skin and risk assessment at admission. An established tool, the Braden Risk Assessment Scale, predicts those most at risk for PrUs and most in need of early prevention. The scale assesses sensory perception, moisture exposure, activity and mobility levels, nutritional status, and friction/shear forces on bony prominences. Other tests are used to gauge peripheral arterial circulation. Patients are then checked every shift for skin alterations, weekly for changes in risk level and, if needed, every two hours for positioning.

Systemwide measures can substantially reduce the likelihood of PrUs. These might include replacing plastic (continued on page 7)

FOCUS ON

Rehabilitation

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A Division of Select Medical



Volume 10 • Issue 4

Focus on Rehabilitation is published quarterly by Kessler Institute for Rehabilitation to bring current issues in rehabilitation to the attention of the members of the medical community.

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Why advocacy is vital for the future of PM&R



ONE OF A PHYSICIAN'S most traditional roles is as an advocate—on behalf of patients and, by extension, their community. Today, U.S. citizens face tremendous health care-related uncertainties. Questions concerning which services will be covered, who will be eligible, and at what cost have never seemed as overwhelming as they do now. Because all these issues can translate into reduced access to care, especially rehabilitation services, advocacy is perhaps the most timely, nonclinical service physicians can provide.

Historically, persons with disabilities (PWD) have been an underprivileged and often discriminated against minority. Legislatively, we've made progress toward ensuring their civil rights. Notably, the 1973 Rehabilitation Act provided equal employment and education opportunities and the 1990 Americans with Disabilities Act offered protections against discrimination. These landmark laws demonstrated that sustained advocacy could achieve remarkable societal change. Despite these statutory strides, PWD still experience major disparities in health care access, largely related to their need for extensive and specialized services.

The federal-state partnership Medicaid permits states considerable discretion as to the types of rehabilitation care they fund; hence, the substantial interstate variation in benefits. Whereas some offer inpatient coverage, others do not; the same holds true for outpatient services.

Even Medicare imposes arbitrary constraints on rehabilitation services by stipulating annual therapy caps for nonhospital-based providers. Although these limits are not meant to be discriminatory, the individuals most in need of these interventions ultimately suffer. Simply put, by trying to control expenditures, Medicare policy creates a health care access barrier for PWD.

If a patient switches from Medicare's fee-for-service program to a Medicare Advantage (MA) plan, he or she may inadvertently trade to downgraded rehabilitation benefits. Like other managed care plans, MA typically directs participants to the least expensive level or site of service, such as skilled nursing facilities instead of inpatient rehabilitation hospitals/units. Additional cost reductions are achieved by not covering durable medical equipment such as powered wheelchairs or other expensive technologies. Private insurers offer policies that similarly discriminate against disabled populations through arbitrary limits on the number of outpatient visits that are covered services.

Accordingly, physical medicine and rehabilitation providers have a social responsibility to be advocates—for patients and their families; to their communities; among colleagues both within and outside their specialty; to state and federal government representatives; and globally. Physicians can find ways to help as individuals, but joining with others to find constructive solutions generally amplifies the message. So, by advocating collectively through professional organizations, it's possible to achieve favorable impacts at all the above levels.

Although finding time and energy for committed advocacy is challenging, failing to safeguard PWDs' access to health care will likely deprive them of essential services. Clearly, it is imperative that providers identify the civic areas in which they can best intercede and then do so—quickly.

Bruce M. Gans, M.D.

Chief Medical Officer

The importance of nonpharmacological techniques for addressing DVT

> BY STEPHEN F. LEVINSON, M.D., PH.D.

PHYSICAL MEDICINE and rehabilitation patients are at an increased risk of deep vein thrombosis (DVT). In a three-year study published in 2006 in the journal *Vascular and Endovascular Surgery*, lower-extremity DVT was found in 34 percent of individuals admitted to a rehabilitation center.

In particular, orthopedic surgery, spinal cord injury, traumatic brain injury and stroke are among the conditions with substantially elevated risk of DVT. For patients in these categories, pharmacologic prophylaxis should be combined with early mobilization to form the first line of defense against DVT. Weight-bearing exercises such as walking are thought to be the most effective activities.

The Consortium for Spinal Cord Medicine issued the most recent guidelines covering mobilization after diagnosis of DVT. Published in 1999, they recommend 48 to 72 hours of bed rest post-diagnosis. Current practice, however, reflects the growing concern that immobility may actually increase the size of the clot.

At Kessler Institute for Rehabilitation, patients are often mobilized the day following detection of DVT; clinical judgment, however, is critical. It is important to remain mobile and avoid becoming bedbound. This is true for both DVT prevention and the rehabilitation of individuals recovering from a general illness or injury and those with general debility.

Additional Strategies

Whether used as an adjunct or alternative to pharmacologic prophylaxis, compression therapy devices need to be used consistently. Care must be taken to ensure they are not left off for extended periods. At Kessler, generally the same therapist applies the device before and after therapy.

Another approach, the use of electrical stimulation to reduce DVT, is not only an unpleasant experience for the patient but also has been inadequately studied and, therefore, remains controversial.

Indeed, there is a paucity of reliable clinical studies in the prevention of this condition. Furthermore, there is even less research defining the role of physical approaches compared with investigations delineating the proper use of anticoagulants. For example, there is a lack of evidence supporting the common recommendation that anticoagulation be discontinued once the patient is able to walk 150 feet.

Despite this limitation, it is possible to distill some important points in preventing and treating DVT and pulmonary embolus:

- The effectiveness of simple compression, or thromboembolic deterrent, stockings is marginal at best.
- Ankle pump exercises can be quite helpful. This movement involves the patient bending the ankle up and down, first with one foot and then with the other.
- Clinicians should be mindful that, although inferior vena cava (IVC) filters are effective, they may produce microemboli.
- Only in cases in which anticoagulation is contraindicated should mechanical means be considered as either an alternative to pharmacologic prophylaxis or an adjunct to weak anticoagulants, such as aspirin.

Being Cautious

A thrombosis localized below the knee seldom results in clinically significant pulmonary embolism, although there is always the chance that the condition might progress. To avoid overtreatment, clinicians at Kessler often will elect to watch rather than treat DVTs that pose a minimal risk for the development of a life-threatening event. Serial Doppler studies performed approximately every five days are usually sufficient to detect clot progression.

The American Academy of Orthopaedic Surgeons' guidelines strongly recommend against routine screening for DVT. It is true that significant DVT may be observed in the presence of anticoagulation, and no current screening method is able to identify hypercoagulopathy. Also, overtreatment of low-risk patients with anticoagulants can result in cases of fatal bleeding. For certain high-risk patients at Kessler, an IVC filter may be directly inserted.

Still, while it is true that screening has a poor predictive value, the associated risk can be minimized by avoiding overtreatment. Kessler errs on the side of protecting patients and therefore individuals are often checked on admission and, if indicated, frequently thereafter.

If Doppler ultrasound studies prevent even a single fatality from pulmonary embolism, it will have been well worth the cost.



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Kessler continues a successful string of grant awards for spinal cord injury research

> BY STEVEN KIRSHBLUM, M.D., AND TREVOR DYSON-HUDSON, M.D.

SPINAL CORD INJURY (SCI) often has devastating effects for the approximately 265,000 Americans currently living with this condition. Although there have been significant advances in medical management and surgical treatments for SCI over the past four decades, more effective therapies are needed, not only to assist individuals in achieving optimal day-to-day functioning but also to help ensure a high quality of life.

In an effort to stimulate clinical research and training activities related to improving the care of SCI, the National

Institute on Disability and Rehabilitation Research (NIDRR), Office of Special Education and Rehabilitative Services, and U.S. Department of Education established the Spinal Cord Injury Model Systems (SCIMS). Approximately every five years, they provide funding to a select number of institutions to serve as SCIMS centers and engage in collaborative as well as site-specific research (see sidebar).

Among the institutions recently granted funding was the Northern New Jersey Spinal Cord Injury System (NNJSCIS), a cooperative effort of

Kessler Foundation, Kessler Institute for Rehabilitation, and the University of Medicine and Dentistry of New Jersey (UMDNJ). To learn more about this prestigious award and the research that it will support, *Focus on Rehabilitation* sat down with the co-directors of the NNJSCIS, Steven Kirshblum, M.D., the medical director and director of Spinal Cord Injury Services at Kessler Institute for Rehabilitation and a professor at UMDNJ-New Jersey Medical School, and Trevor Dyson-Hudson, M.D., the interim director of Kessler Foundation's Spinal Cord Injury Research Laboratory and an assistant professor at UMDNJ-New Jersey Medical School.

Focus on Rehabilitation: What are the objectives of the SCIMS project, and what types of outcomes do you plan to study?

Trevor Dyson-Hudson, M.D.: As a "center grant," the overall objective is to provide comprehensive, multidisciplinary services to individuals with SCI and to generate research that contributes to evidence-based rehabilitation interventions and clinical and practice guidelines. To that end, each SCIMS center must achieve four broad aims: offer multidisciplinary care, gather data on long-term outcomes, produce a site-specific research project concerning innovative approaches to treating SCI, and participate in collaborative research with other SCIMS centers.

Steven Kirshblum, M.D.: Our site-specific study is titled "Restoring Lost Functions after Spinal Cord Injury: Combination Therapy with Dalfampridine and Locomotor Training for Persons with Chronic, Motor Incomplete Spinal Cord Injury." The aims of this study are to determine the efficacy and safety of combination therapy with dalfampridine and locomotor training on improving walking and standing in persons with



Kessler Institute for Rehabilitation and Kessler Foundation conduct many studies, and the new Model Systems grant will lead to further research to potentially help individuals with spinal cord injury regain motor function and improve their quality of life.

chronic, motor incomplete SCI. However, there is also promising evidence from earlier studies and our own experience in clinical trials that dalfampridine and locomotor training separately are associated with other potential benefits. These include improved sensory and motor function, bowel and bladder control, and sexual function and pulmonary function. They also are linked to reduced spasticity and neurogenic pain, and improvements in overall quality of life. Assessing these outcomes will be of importance as well.

Focus: You mentioned that among the requirements of the Model Systems grant is to conduct collaborative research. How is this achieved?

Dyson-Hudson: In two ways: First, the project is collaborative in the larger sense that it is a multicenter study where participating SCIMS centers meet on a semiannual basis to collectively discuss shared projects in which we will combine data and examine common outcomes of interest, like determining the prevalence of certain injuries or establishing evidence-based guidelines for care. But then there is also collaboration among our SCIMS member organizations on our site-specific project on dalfampridine and locomotor training. The Model Systems grant that we have been awarded is made possible solely because of the relationships that exist between UMDNJ, Kessler Institute and Kessler Foundation, so there isn't an area in this grant that doesn't involve some sort of cooperation. It truly is a team effort that all three institutions take pride in. And through this collaboration, we are able to offer a comprehensive system of care to persons with traumatic SCI from the time of their injury all the way to long-term follow-up in the community, and to conduct novel and innovative research that will have a significant impact on individuals with these injuries.

Focus: You noted that the SCIMS centers will share data collection and analysis. Can you describe this some more?

Kirshblum: We collect data on newly injured persons with traumatic SCI and then follow up with these individuals every five years (more frequently for clinical related matters) to document for the national database any changes with their health status, employment, quality of life and other outcomes of interest. The data that all SCIMS centers collect is submitted regularly to the National SCI Statistical Center at the University of Alabama at Birmingham, where it is available for analysis. Most of what we know in terms of the epidemiology of traumatic SCI, as well as the long-term health outcomes and community integration of persons with SCI, is based on the data collected by SCIMS centers.

Focus: This grant occurs in five-year cycles, and this is the fifth time that

NNJSCIS has been selected as a recipient. Can you describe the significance of receiving such an award?

Dyson-Hudson: The title "SCI Model System" is definitely a mark of distinction, as there are only 14 SCIMS centers in the U.S. Although we have been an SCIMS center since 1990, there is no guarantee that we will receive the award when we apply for the grant every five years. In fact, the grant agency makes it perfectly clear that previous SCIMS centers have no competitive advantage over non-SCIMS centers.

Kirshblum: That's right. Each cycle is a competitive grant application process. Success or failure might come down to a few minor factors. It points out the comprehensiveness of our clinical and research program that we have here in northern New Jersey. It is really hard to put into words the profound sense of accomplishment and humility we all feel for being given this opportunity.

A BLUEPRINT FOR SUCCESS

The select number of institutions currently designated as SCIMS centers in this country are known as such because they have the distinction of being considered by NIDRR as top-notch models of how best to care for individuals with SCI. These centers are helping to advance the field of rehabilitation and physical medicine by developing and demonstrating a comprehensive, multidisciplinary set of services for those with SCI, and by further evaluating the efficacy of their system by collecting and analyzing data on system benefits, costs and outcomes.

The projects conducted by SCIMS centers are established to better understand the course of recovery and outcomes following the delivery of a coordinated system of care for SCI, including emergency care, acute care management, comprehensive inpatient rehabilitation, and long-term interdisciplinary follow-up services. The success of these programs is in no small part due to the tireless efforts of a vast range of experts, including physiatrists, orthopedic surgeons, neurosurgeons, therapists (occupational, physical, recreational, speech and nutrition), nurses, psychologists and psychiatrists, case managers, and researchers—and, of course, to the invaluable contribution of the numerous patients and families each SCIMS center serves.



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Seizing the opportunities found in ‘care coordination’ in a time of change

> BY BRUCE M. GANS, M.D.

MEDICAL PROFESSIONALS and institutional providers alike anticipate broad sector changes with the ongoing implementation of the Affordable Care Act (ACA). Virtually all this reform—both government-mandated and that consequently created by market forces—will focus on care coordination under the belief that delivery system improvements will yield better quality at less expense. The immediacy and magnitude of the reform’s impacts offer wide-ranging opportunities for care delivery approaches.

In the public sector, the ACA has highlighted the need for novel care coordination efforts. One of its initial innovations, the accountable care organization (ACO), teams primary care practitioners with health care facilities. Operationally, an ACO shares financial risk and potential gains by carefully managing patient care. Also, the Centers for Medicare and Medicaid Innovation (CMMI) recently published its bundled payment initiative. This program solicits proposals for innovative delivery system changes that enhance care coordination; CMMI offers the possibility of waiving Medicare regulations and permitting gain-sharing while getting discounts in return.

In the private realm, commercial insurers are already working with physicians and hospitals to partner with the principal objective of reducing health care expenditures and a secondary goal of improving quality.

Opportunity Knocks

Echoing Medicare’s mantra that better care for the individual translates to enhanced health for the community and greater cost-effectiveness for the country, the above efforts are predicated on the belief that our nation’s care delivery can be better managed to eliminate its considerable waste and inefficiency. Although this concept makes sense, it is

an assumed rather than a documented correlation—little more than an intelligent idea, albeit one promoted with conviction. Actually, few relevant studies to date have yielded truly generalizable findings.

Nonetheless, these reforms offer opportunities for physiatrists and inpatient rehabilitation hospitals/units (IRH/Us), as both can participate in improving care coordination.

If physiatrists join the acute hospital medical teams of patients whose illnesses or injuries will likely require rehabilitation—and do so at the earliest

trajectory of care. Maintaining long-term involvement is actually an old concept whose time has returned.

A Marketplace Niche

In the institutional arena, IRH/Us can affiliate with acute care referral sources and other continuing care facilities to standardize patient data—its collection, management and monitoring. Providers that share data infrastructures can more easily communicate about patients throughout their stay. Instead of viewing post-acute providers such as skilled nursing facilities as competitors, IRH/Us

Physiatrists and IRH/Us have important roles, special niches in the delivery system, but only if they approach other specialties and facilities as partners instead of competitors.

possible time—they can help preplan an individual’s entire sequence of care, improving outcomes and efficiency. For conditions with somewhat predictable clinical courses, physiatrists can collaborate in implementing standardized medical plans, adapting them where appropriate. Unlike acute care clinicians who are responsible for a person’s moment-to-moment status, physiatrists can focus on preventing chronic issues such as skin ulcers and contractures. And, in contrast to physicians charged with stabilizing the patient and treating the current condition, the rehabilitation doctor can strategize about the longer-term.

For individuals who transfer from acute to post-acute settings, physiatrists can coordinate their care, continuing oversight even once they are home. This can have far-reaching benefits, potentially influencing the entire

should approach them to determine where each best fits into the health care ecosystem. With foresight and planning, they can position themselves as complementary parts of an entire system of care.

To respond to the challenges of reimbursement reductions and demands for increased quality, thoughtful care coordination will benefit patients and providers. Physiatrists and IRH/Us have important roles, special niches in the delivery system, but only if they approach other specialties and facilities as partners instead of competitors. Viewing this scenario from a business perspective, medical advances and demographics—our growing and aging population—essentially guarantee the consumer demand for care. By collaborating, we can ultimately provide better care for our patients. And this has been our objective all along.

Wound woes: Prevention and treatment of a common problem

(continued from page 1)

and rubber incontinence products with breathable versions. Materials on older beds often do not relieve pressure on the skin where there are bony protuberances; at Kessler, support surfaces are used for prevention, such as alternating-pressure and high air-loss mattresses. These provide superior pressure redistribution, a key strategy in decreasing the risk of PrUs.

An Evolution in Treatment

Management of PrUs has evolved considerably from the days of using Maalox, sugar and heat lamps to “dry up” wounds. For areas of redness or minor abrasions (generally Stage I or II ulcers), increased monitoring, repositioning, a change of supporting surface, and protective padding or dressings often suffice.

Higher-stage ulcers involve damage to the epidermis, dermis and subcutaneous fat (Stage III) or even full-thickness tissue loss with exposed bone, tendon or muscle (Stage IV). For these, more intensive management is required. First, wounds are typically cleaned with saline, after which various debridement methods—e.g., autolytic, mechanical or enzymatic—might be employed. Additional therapy may be needed for any associated pain or infection.

In the most common procedure, autolytic debridement, occlusive dressings are used to aid in digestion of dead tissues by the enzymes contained in wound fluids while simultaneously preventing moisture loss. Drainage wicked from the PrU combines with the covering material to form a protective gel. This method is used for smaller dry or minimally exudative lesions. Dressings can contain hydrocolloids, foam, alginates, film, hydrofiber, hydrogel or collagen. Silver-impregnated

products might be indicated for their antibacterial effects.

Mechanical debridement removes thick exudate or loose necrotic tissue from PrUs. For smaller areas, hydrotherapy, wound irrigation or dextranomers (absorbent carbohydrate beads) can be used; larger areas of dead tissue might be removed with a scalpel or scissors at the bedside or in the operating room.

Enzymatic debridement, which uses collagenase or another substance to remove necrotic cells from wound beds, is widely accepted as a conservative form of debridement. It can be a good option for patients who are not candidates for surgery.

Other Approaches

Topical growth factors and artificial skin have shown promise in management of PrUs, but they cannot relieve mechanical stresses on skin or tissue ischemia. In randomized, controlled trials, low-level laser therapy has exhibited no improvement over standard care. Although evidence does not generally support the routine use of hyperbaric oxygen for PrUs, it can provide benefits for selected patients.

Another method, negative pressure wound therapy, creates a partial vacuum to remove debris and drainage from and increase blood flow to PrUs. This aids healing through wound retraction, stimulation of granulation tissue formation, continuous cleansing after primary surgical debridement, continuous removal of exudate and reduction of interstitial edema. The procedure also might spur healing by stretching the surrounding cells; in preliminary models this has been shown to promote cellular reproduction.

Prevention, however, remains the best strategy to avoid PrUs. The use of standardized screening, risk assessment and documentation protocols is of paramount importance, as is interdisciplinary collaboration among nurses, physicians, therapists and nutritionists.

COMPONENTS OF A HIGH-QUALITY WOUND CARE PROGRAM

1 Prevention: vigilant monitoring of nutritional status, positioning and therapies; attention to comorbidities; management of moisture; early use of pressure-redistribution support surface

2 Weekly risk and skin assessments: administration of Braden or other evidence-based risk assessment scale for consistency

3 Staff education in detecting and staging wounds: access to wound care courses, training from professional organizations and online programs; participation in quarterly rounds and prevalence surveys

4 Anatomic and photographic documentation: application of standardized, evidence-based protocols and images compatible with electronic records; incorporation into daily nursing procedures

5 Nurse-physician communication: other consultations as indicated

6 Wound management protocols: maintenance of fully stocked inventories of standard supplies; coordination of interdisciplinary rounds; use of wound care extenders

7 Education for the patient and family: employment of multiple methods as appropriate



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Moving beyond the surface: Mental health conditions call for comprehensive care

> BY MONIQUE TREMAINE, PH.D.

FOR MANY PATIENTS requiring medical rehabilitation services for acquired brain injury, the damage they have experienced is more than skin deep. Psychiatric conditions are as real a threat to one's functioning and quality of life as physical diagnoses. By providing proactive care from mental health experts, Kessler Institute for Rehabilitation is helping patients heal in more ways than one.

Mental health problems are not a rare co-occurrence of neurological insult. Half of all individuals who sustain a traumatic brain injury will develop subsequent anxiety or depression, and approximately 18 percent will consider suicide. In stroke survivors, the incidence of depression can be as high as 60 percent. Diagnosis is complicated by the variability in which symptoms can manifest: In some patients, signs appear relatively soon after the event, while in others, depression and anxiety result from a prolonged recovery course and will often appear within a year.

Mental health issues occur in acquired brain injury populations for many reasons. Often, neurological trauma happens without warning and results in immediate and devastating changes for survivors and their families. Most adjustment difficulties arise from loss of independence and of ability

to participate in normal life activities. Contributing factors are numerous and include job termination, changes in family dynamics, dependence on others for self-care (for example, through nursing home placement), financial distress, decreased self-esteem, reduced social support, and lack of access to resources.

Kessler's neuropsychology department provides evaluation, psychotherapy and appropriate referrals to patients who require support. Following evaluation, many will participate in the Cognitive Rehabilitation Program, ideally in advance of developing clinical-level symptoms. This outpatient, multidisciplinary service provides individualized and comprehensive treatment for persons with acquired brain injuries, with interventions focused on rehabilitation of cognition, development of patient-tailored compensation strategies, management of psychosocial difficulties, and establishment of appropriate community and job reentry goals.

Ultimately, clients are assisted in redefining sense of self following injury.

With effective treatment, individuals are encouraged to be proactive in their recovery, helping to reduce their risk for developing future psychiatric symptoms. This includes access to social support and resources and forming an overall feeling of empowerment. Left untreated, mental health problems can impact rehabilitative care. Depression, anxiety, and difficulty coping with changes in thinking, personality and lifestyle can halt the rehabilitation process altogether. Those who are unable to redefine their lives in terms of their injuries will often overrate their quality of life prior to injury, preventing them from effectively using compensation strategies or exploring new avenues of employment. This often leads to social isolation and failure to reintegrate into the community. By addressing these issues upfront, and ideally prior to the development of significant psychopathology, patients are given the greatest opportunity for recovery.



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