STROKE REHABILITATION

Stroke is the commonly used term for what physicians call a cerebrovascular accident or CVA. Stroke is a process where there is sudden injury to the brain that is not associated with trauma. Strokes can be divided between those involving an interruption of blood supply to the brain ("ischemic stroke") and those involving bleeding in the brain ("hemorrhagic stroke".) Strokes are further divided depending on the area of the brain involved. The problem with strokes is that the brain damage almost always interferes with function in some way. These functional deficits are called impairments.

Stroke related impairments are of many types. When "motor pathways" are damaged, weakness or paralysis results. In general, injury to one side of the brain affects the other side of the body. Paralysis starts off "flaccid" (floppy) and, if there is less than full recovery, usually becomes "spastic" (stiff and resistant to movement.) Other impairments include loss of coordination, sensation, or vision. There can be loss of balance and difficulty walking with frequent falls. There may be trouble swallowing ("dysphagia"), trouble speaking ("dysarthria"), or an inability to express or understand language ("aphasia"). Patients may have double vision, facial weakness, or trouble controlling their bladder. Some patients have impairments in their thinking and can be inappropriately happy with bad insight into their condition or can become depressed.

The field of rehabilitation has developed to become a standard part of therapy for stroke patients who are left with residual "fixed" deficits. Although one of the oldest forms of treatment, it is one of the least understood. Many physicians are uneasy with rehabilitation. This is due to two problems. One is the limited exposure to rehabilitation and its practitioners in medical school. (In Tennessee, there is no residency program in the medical field of Physical Medicine and Rehabilitation [PM&R] and most medical students never even meet a Physiatrist. At UT, we have two on staff in the Surgery Department.) Also, medical training has traditionally emphasized diagnosis and curative treatment. Some physicians may face a feeling of failure and futility when the disease progresses despite his/her best efforts. Patients and their families may have a fatalistic view toward a stroke and lack the motivation to overcome the disability. **However, when cure is not possible, patients need counseling, rehabilitation therapy, and support in the face of their physical disability.** I advise my patients to "deal with the present and pray for the best". The goal of rehabilitation is to permit a return to optimal function.

Patients who suffer strokes are at risk for an array of complications in other body systems. Skin must be protected to avoid bed sores ("decubitus ulcers"), the bladder and bowels must be managed to avoid complications, and the patient should be monitored closely due to the high risk of blood clots in the legs ("deep vein thrombosis"/ "phlebitis"). Close attention is needed to prevent pneumonia (and treat early if it occurs). Patients should be mobilized early to prevent weakness due to lying too long in bed ("deconditioning") and to help prevent some of the above-noted complications. If the patient has a paralyzed arm, IVs are best used in that arm so as much independence as possible can be encouraged.

To optimize recovery, rehabilitation should begin soon after the stroke. When consulted early, physiatrists are a big help to the admitting acute care physician who wishes to be sure no important rehabilitative issues are missed. It should always be asked whether there are swallowing problems even if not clinically apparent because they are

often “silent” because the cough reflex is suppressed. Whenever there is a question, the speech pathologist should be consulted immediately to help decide on the optimal means of nutrition to avoid aspiration pneumonia and malnutrition. Often formal swallowing studies are necessary to recognize “silent aspiration”. Counter intuitively, thin liquids are usually harder for the stroke patient to swallow than are puddings or even a soft diet. Of course speech therapists also help with communication. When the patient is medically stable, bedside physical therapy and/or occupational therapy should be started within 48 hours. In the acute hospital setting, therapists can help the treating physicians determine whether the patient is safe in mobility or if there are balance deficits. There are objective balance assessment tools that help identify patients at fall risk. For the more severely involved patients, therapists can help maintain joint motion and help with more basic mobility and self-care skills. Too early a focus on walking can detract from other more important activities and cause harm over the long run. Improper application of splints can lead to irreversible hand contractures or, in the legs, pressure ulcers.

Once stable in the acute hospital ICU or medical floor, hospitals need their patients to move on so their acute bed can be available for others. Case managers (nurses, social workers, or rehab counselors in different hospitals) then begin a discussion with the treatment team and family about moving on to “another level of care”. The physiatrist is expert in making this determination by considering the complex interaction between medical needs, the patient’s rehabilitative prognosis over the short and long term, and the network of social supports. Unfortunately, financial considerations/insurers can undermine this objective assessment of what is best for the patient and mandate other placements. Such levels of care options include LTACH (a “**L**ong-**T**erm **A**cute **C**are **H**ospital” such as Select Specialty Hospital) for the sick patient needing a high level of ongoing nursing and medical attention[1], SNF (**S**killed **N**ursing **F**acility, also called a TCU when in a hospital) for the more stable patient[2], or “acute rehabilitation” for those who are relatively stable, need daily nursing attention, would benefit from a multidisciplinary approach to therapy, and can tolerate/benefit from at least three hours of therapy daily. Patients may move between these settings to optimize their recovery.

Patients discharged to home often need nursing and therapy at home, via “home health”. There are many home health agencies. Twenty-four hour per day care is almost never a service covered by insurance. Patients who are not confined to home (“home bound” except for visits to their physicians) often benefit from outpatient therapy services.

In the outpatient setting, physiatrists effectively manage rehabilitation programs in partnership with the primary care physician/provider or neurologist who are addressing the non-rehabilitative acute medical issues such as anticoagulation, blood pressure, cholesterol, and diabetes mellitus. Besides their proven cost-effective supervision of the

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[1] Patients ideal for an LTACH include those with a tracheostomy and on a ventilator, those needing expensive and prolonged antibiotic regimens, those still in or emerging from coma, and those with complex wounds.

[2] Patients ideal for a SNF have a low level of need for attention from a doctor (3 visits per week at the most with NO specialist visits), little need for further medical tests (X-Rays and tests of blood gases are particularly difficult), a relatively low need for nursing attention (more than four hours of care per day or dressing changes more than once a day is a stretch), who need only about 1-2 hours of therapy per day, and who are willing to forego the availability of cardiopulmonary resuscitation during their ongoing care and rehabilitation.

therapy program, physiatrists also treat some of the particularly challenging rehabilitative problems. Spasticity can be a serious problem leading to pain, contractures, pressure sores, limb loss, and further disability. It can sometimes be treated with medication, but may need such interventions as neurolytic block with phenol, chemodenervation with Myobloc® or Botox®, splinting, serial casting, manipulation under anesthesia, or surgical releases.[3] The shoulder in hemiplegia can be a particularly difficult problem[4], but it often responds to a multifaceted treatment approach including neurolytic blocks or chemodenervation of the subscapularis muscle[5]. Besides the multiple problems described above as occurring in the acute setting and which can also occur in the outpatient setting, other problems can include UTIs (urinary tract infections), urinary retention, constipation or bowel incontinence (bowel and bladder control problems are the major factors leading to permanent nursing home placement), delirium associated with a "nondominant parietal lobe syndrome", anosognosia (inability for a person to recognize their disability—such as a paralyzed left half of the body!), sleep disorders including sleep apnea, severe depression, nutritional deficits, anorexia, hemianopsia (inability to see on one half of the body), shoulder-hand syndrome (CRPS, complex regional pain syndrome—also called RSD, reflex sympathetic dystrophy in the past), and the very challenging "central pain syndrome of Dejerine-Roussey." Patients may require splints to support paralyzed limbs. Patients with excellent recoveries may have concerns about the safety of their return to driving or to work.

The most effective experts in rehabilitation always treat patients and their families holistically. The assessment should dig deep enough to identify what things are most important to them, to thoroughly understand their social and spiritual network, and to know how they have coped with problems in the past. Premorbid physical, psychological, social, and financial disabilities should be identified and minimized. All impairments associated with the stroke must be identified and addressed. Comprehensive rehabilitation should not rest until dignity is restored as much as possible and patients/families/significant others can cope with the life changes caused by the stroke. Rehabilitation should strive to help patients and their loved ones find meaning and personal growth through this difficult experience.

Jeffrey S. Hecht MD,
Associate Professor and Chief, Division of Surgical Rehabilitation
Department of Surgery, University of Tennessee Graduate School of Medicine
1932 Alcoa Highway, Suite C580, Knoxville, TN 37920
865-544-6333

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