GENERAL PRINCIPLES OF NEUROREHABILITATION

KEY POINTS:

- Development of an active rehabilitation program depends heavily on the principles of learning theory.
- An active program combines restorative and substitutive approaches in an individualized rehabilitation scheme.
- Goals are prioritized based on their importance to the patient and family, the degree of health risk to the patient, the likelihood of treatment response, and the initial steps needed to reach larger overall goals.

THE REHABILITATION PROCESS

Rehabilitation may be defined as the coordinated use of medical, social, educational, and vocational measures for bringing a person to the highest functional level possible. The rehabilitation process itself consists of two partially overlapping elements: preventative rehabilitation, including modification of risk factors to prevent recurrence, and active rehabilitation. Development of an active rehabilitation program depends heavily on the principles of learning theory and on recognition of the influence of rehabilitation on intrinsic and adaptive recovery, changes in performance being produced by specific training. An active program combines restorative and substitutive approaches in an individualized rehabilitation scheme. A coordinated interdisciplinary team approach is essential for success of such a program; the composition of the team may vary but in general includes a physician knowledgeable in rehabilitation, rehabilitation nurses, physical, occupational, and speech therapists, psychologists, and social workers.

THE ROLE OF THE PHYSICIAN AND TEAM

The physician who specializes in rehabilitation combines the medical management of a disease with management of the functional effects of that disease on the life of a person and the family. Most physicians have been trained extensively in the medical model and basically address the symptoms and signs of a disease, i.e., impairments. In addition to traditional medical training, on the other hand, the rehabilitation physician receives training in the functional model and is thus prepared to address the effects any given medical impairment will have on the person's ability to perform expected activities (disabilities) and to fulfill roles in society (handicaps).

Although the medical model may be appropriate for acute illnesses, it does not effectively deal with the chronic and complex problems of the neurologically disabled. For example, the physician may focus on spasticity, tremor, or pain associated with a specific neurological disease, while the patient's interest is in driving, cooking, and returning to work. Depending on the setting, the physician assumes a role either as an active team member or as team leader, guiding the rehabilitation team in development of a realistic rehabilitation plan with achievable goals. In either setting, the physician must acknowledge the skills and competencies of the other rehabilitation professionals and be able to assess the effects of their proposed treatments on the patient's overall level of function. To do so requires that the physician have broad-based knowledge of a variety of rehabilitation interventions. Facilitating the team process requires excellence in communication, interpersonal, and organizational skills.

The rehabilitation team generally follows a regular series of steps to ensure the accomplishment of rehabilitation goals (**table 1**). Each team member actively participates in the goal setting process, which should mesh the recommendations of the professionals with the interests, values, and lifestyle of the patient and family. Goals are prioritized based

KEY POINTS:

- Rehabilitation goals must be appropriate, i.e., realistic and achievable, and measurable.
- The overall goal of any treatment plan is to help the patient achieve optimal functional capacity.
- Inpatient rehabilitation itself focuses on the acquisition of skills necessary to perform activities of daily living (ADL) to enable a safe discharge to the home setting.

TABLE 1 **Rehabilitation team process**

1. **Evaluate:** Impairments, disabilities, handicaps, baseline and treatment response
2. **Identify:** Resources, interests, values, lifestyle
3. **Set goals:** Initial, prioritize, reset
4. **Treat:** Facilitate recovery, adapt, compensate, problem solve, train and educate, motivate
5. **Follow up:** Monitor patient status, problem solve, resource

on their importance to the patient and family, the degree of health risk to the patient, the likelihood of treatment response, and the initial steps needed to reach larger overall goals. Thus, both the patient and family become active members of the rehabilitation team to be included in all phases of the process. Rehabilitation goals must be appropriate, i.e., realistic and achievable, and measurable, to allow accurate documentation of progress and outcome.

Regardless of specialty, all team members work on broad interdisciplinary goals such as orientation, behavior, mobility, and toileting. Response to treatment and goals are ideally reviewed, updated, and modified as the patient's medical and functional status changes. The initial goals and rehabilitation plan, along with revisions and modifications, must be reviewed regularly with the patient and family and clearly documented in the patient record. It hardly needs to be said that the overall goal of any treatment plan is to help the patient achieve optimal functional capacity.

REHABILITATION SETTINGS

Rehabilitation is increasingly undertaken in a variety of settings, including inpatient facilities, outpatient clinics, home, school, and workplace. Programs in these different settings develop individual admission criteria which define the characteristics of the patients to be accepted. Policies and procedures must also be developed to define precisely the program's mission and organizational structure and to establish a pattern of review of program quality through outcome evaluation and follow-up.

Inpatient rehabilitation generally follows a period of acute hospitalization for a disabling illness or injury, the combined effects of medical and rehabilitation problems often precluding discharge home directly from the hospital. Increasing pressure to deliver rehabilitation services in a cost-effective manner has resulted in the appearance of alternatives to acute inpatient rehabilitation. Many of these are referred to as "subacute," although the meaning of the term is admittedly unclear. To improve the definition of these programs and to ensure quality rehabilitation, accrediting agencies such as the Commission on Accreditation of Rehabilitation Facilities (CARF), and the Joint Commission on Acreditation of Healthcare Organizations (JCAHO) have developed operational standards. **Table 2** outlines CARF inpatient rehabilitation categories 1–3.

Inpatient rehabilitation itself focuses on the acquisition of skills necessary to perform activities of daily living (ADL) to enable a safe discharge to the home setting. Discharge usually occurs when the patient functions at a minimal assist (patient performs 75% or more of the task) to supervision level (requires

presence of another person for safety, but no physical help) in ADL. When the patient is discharged at a level lower than self care, the rehabilitation team must focus on family training in the skills necessary to care safely for the patient at home. If the patient fails to reach a functional level compatible with the family's abilities and resources to render care at home, and if progress in rehabilitation has slowed or ceased, alternative options must be considered.

Following inpatient rehabilitation, the majority of patients require additional rehabilitation services in the home or outpatient setting. The rehabilitation team and the patient must now concentrate on skills necessary for community reintegration, homemaking skills, and return to school or work. The team works closely with the school or potential workplace to provide appropriate modifications, structure, and programming while simultaneously identifying community resources and funding options. Discharge from medical rehabilitation occurs when goals are met or progress ceases, or, as may unfortunately be the case, when insurance coverage can no longer be provided.

After discharge from medical rehabilitation, some patients continue on into vocational or day activities programs. All patients with continued disability require periodic follow-up to ensure maintenance of function and to reduce complica-

KEY POINT:

- Following inpatient rehabilitation, the majority of patients require additional rehabilitation services in the home or outpatient setting.

TABLE 2 Summary of CARF Comprehensive Inpatient Categories I–III

	Category I	Category II	Category III
Facility/licensure	Hospital	Hospital Hospital-based SNF SNF	Hospital-based SNF SNF
Medical	High risk of instability	Variable risk of instability	Low risk of instability
Physician contact	Regular direct contact based on the need, usually 5–7 days/week	Regular direct contact based on the need, usually 3–5 days/week	Regular direct contact based on the need, usually 3–5 days/week
Nursing	Multiple/complex rehab nursing needs; potential for high medical acuity needs	Multiple/complex rehab nursing needs or potential for high medical needs	Routine rehab nursing needs and low risk for high medical acuity
Therapy	Interdisciplinary team >3 hours/day	Interdisciplinary team >1 hour/day	Interdisciplinary team 1–3 hours/day
Outcomes	Return to community with home/outpatient rehab	Return to community Move up to Category I	Return to community with support
Examples	Traumatic brain injury, stroke, anoxia, spinal cord injury (all with complex rehab medical issues)	Traumatic brain injury in coma, multiple trauma, stroke, orthopaedic conditions	Uncomplicated orthopedic, amputees, uncomplicated multiple trauma

CARF Commission on Accreditation of Rehabilitation Facilities
SNF skilled nursing facility

tions. The frequency and nature of the follow-up reflects the specific residual medical problems and disabilities. The rehabilitation team must remain available to the patient and family on a long-term basis, functioning, for example, to provide information on available resources as well as to advocate on behalf of the patient when necessary.

REFERENCES

▶ **Cobble N, Burk JS. Introduction to the principles of neurorehabilitation. J Neurol Rehabil 1990;4:181–196.**

Covers the role of the physician, goal setting, and the team approach.

▶ **Commission on Accreditation of Rehabilitation Facilities (CARF) 1996 Catalog of Publications. CARF, 4891 East Grant Rd., Tucson, AZ 85712 [Tel. (520) 325–1044].**

From the experts on rehabilitation accreditation: standards, guidelines, program evaluation, outcome measurement, and more. A must for anyone with administrative responsibility for a rehabilitation program.

▶ **Good DC, Couch JR, Jr, eds. *Handbook of Neurorehabilitation*. New York: Marcel Dekker, 1994, 684 pp.**

Chapters 1 (History and Examination), 7 (Interdisciplinary Team Approach), and 8 (Social Concerns and Discharge Planning). This is currently the only comprehensive neurorehabilitation textbook. Look for more comprehensive texts to be published in 1996.

▶ **Kelley MW, ed. *Subacute Care Services: The Evolving Opportunities and Challenges*. Chicago: Irwin, 1996, 255 pp.**