those provided through occupational therapy, social activities with visitors, intellectual stimulation from reading, television, and radio stimulate an increasing response from the patient and help to maintain his level of performance. However, none of these are as effective as release from bed and the restrictions of four walls by transfer to a wheelchair or resumption of ambulation.

Summary

Efficient rehabilitation of the severely disabled patient is possible only if deterioration is prevented and the patient's abilities are preserved. Prolonged inactivity in itself causes deterioration of many organ systems. Rapid deterioration of neuromuscular, skeletal, cardiovascular, respiratory, urinary, and intellectual function occurs. Bed rest for patients with disabilities of long duration may produce deteriorative changes which permanently disable these patients or greatly delay their recovery.

Intelligent use of activity to maintain the abilities of the unaffected parts of the body together with adequate protection for the involved parts of the body will decrease the time required for restoration of the patient to maximal usefulness.

Nursing Care

Eleanor M. Anderson, R.N., R.P.T., M.P.H.

THE RESIDUAL disabilities and secondary deformities which occur in patients with chronic disease or long-term illness present an ever-increasing challenge to nursing service personnel in the hospital, nursing home, or the patient's home. Prevention of deterioration is not an easy task, and it still requires considerable study. However, to what extent can we ask the patient to suffer long hours of pain and discomfort, extended hospitalization, or permanent disability developed because of inadequate nursing care?

Successful physical restoration of a person who has been forced to inactivity because of some long-term disease process may be hindered or enhanced by the nursing care which he receives during his prolonged course of treatment. The development of contractures in the upper and lower extremities of the patient following a stroke, the hip flexor tightness after periods of bed rest (fig. 5), still occurs far too frequently for nursing to consider its job well done.

The coordination of physical and occupational therapy with nursing service leaves much to be desired in many institutions and home-care programs. Patients are spending several hours in therapy having extensive exercises and painful stretching for tightened musculature developed because of poor positioning and lack of consideration for range of joint motion. For the remaining 21 or so hours the patient may be left in his bed without supportive measures to maintain his lower extremities in the normal alignment to which the therapy is aimed. Hence, his therapy program is defeated. Nursing alone is not liable for this inadequacy of communication—all members of the participating team must share this responsibility.

One of the most fundamental physiological laws is that the functional efficiency of an organ or system improves with use and regresses with disuse. Everyone is familiar with the increasing power and efficiency of skeletal muscles which result from usage and the atrophy which takes place in muscles whose motions are prevented by paralysis.

The results of deterioration of the bedfast patient have been emphasized in the preceding article, which mentions significant studies relating to patient care. These have definite implications for nursing.

The alert, intelligent, and capable nurse understands the physiology of disuse, is familiar with current research regarding patient care, and practices nursing measures that prevent deterioration of the bedfast or immobile patient. This nurse understands the ministrations needed by the patient, provides assistance when the patient cannot do for himself, and encourages and teaches him self-care toward independence when she recognizes his readiness and motivation for increased activity. The following are nursing measures, some old and some new, which will aid in the prevention of the deteriorative process.

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Mobility

Prevention of contractures is far easier than corrective therapy. Preventive treatment consists of both proper positioning and activity to maintain range of joint motion.

A prime consideration for preventing contractures and deviations of the normal body alignment is a bed with a ¾-inch board beneath a firm felt or innerspring mattress and a footboard to keep the sole of the foot at a right angle to the leg (fig. 3). The footboard should be adjustable to any position along the bed to accommodate patients of varying heights, as well as adjustable at the bottom of the mattress so that the patient's heels are off the mattress when the bed is flat. When the patient lies prone, his feet extend between the end of the mattress and the footboard. In addition to promoting good body alignment, this kind of bed provides enough firmness to enable the patient to gradually move independently about the bed as soon as possible. The side-lying and face-lying positions should be encouraged and practiced daily. *Lying prone for 30 minutes twice a day is helpful toward preventing hip flexion contractures.*

With an ordinary mattress on ordinary springs, a patient's hips may sag from 2 to 5 inches. This sagging may not be apparent on casual inspection, and if the patient is bedfast contractures may develop and produce muscle deformity. A sitting position on an ordinary bed during the day will only encourage this shortening of the flexor fascia of the hips.

Maintenance of full range of motion of all joints and flexibility of the soft tissues is an important factor in prevention of deterioration of the bedfast patient. When joints are immobilized, the lack of motion in the surrounding joint capsules, connective tissue, and muscles allows fibrosis to occur. Consequently, joint motion becomes limited and the patient is handicapped. Active motion, when possible, is the simplest way to maintain mobility. However, patients cannot be expected to maintain this mobility unless they are given a specific exercise program.

The nurse can effectively carry out range of joint motion while giving a bath or by instructing a patient or his family regarding this procedure. The nurse's keen observation during the bath process will enable her to evaluate the patient's ability to maintain his own range of motion. When instructing the patient, she should emphasize the motions which are not

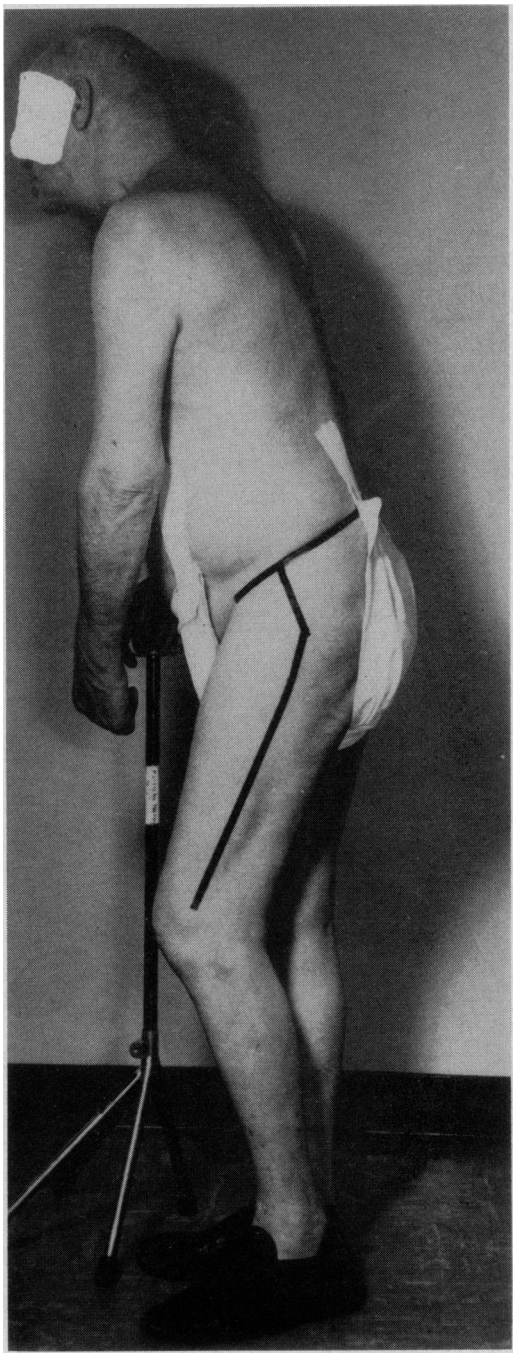

Figure 5. Hip flexion contracture resulting from prolonged inactivity in bed following hemiplegia. The knee is held flexed to partially compensate for the limitation of hip extension.

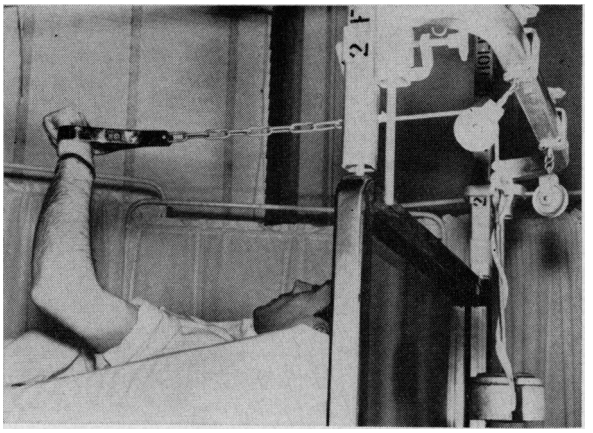

Figure 6. Pulley apparatus for exercising uninvolved upper extremities

effectively carried out in the affected extremity. If a patient suffers with acute myocarditis or has a low cardiac reserve, passive motion is the method of choice. Gentle passive motion increases the metabolic demand very little, far less than the increase caused by eating. If all joints which do not need to be immobilized are gently carried through the range of motion twice daily, contractures can be prevented.

In patients with coronary occlusion, contractures commonly develop in the hips, shoulders, and knees during the acute stage of the disease while the patient is bedfast. Later during convalescence these contractures are a handicap to recovery. Joints or extremities which need support should be moved passively by a trained therapist. Painful joints frequently can be moved freely if the extremity is supported and moved gently. The physical therapist may instruct the nurse in the procedure and the necessary caution.

Muscle Strength and Endurance

In order to maintain muscular strength and endurance, the patient who must remain in bed for an extended time should be given exercises. A few strong contractions of a muscle each day are adequate to maintain the size and strength of the muscle. The nurse might encourage the patient to tighten his abdominal, gluteal, and quadriceps musculature two to five contractions, three times a day. Pulleys or other exercise apparatus attached to a Balkan frame enable the bedfast patient to exercise the muscles of his uninvolved extremities (fig. 6). Sit-up or push-up exercises can be used to strengthen arms and trunk. The therapist might adapt an assistive or resistive exercise apparatus for the lower extremities for the period of time that the patient must remain in bed. With the instructions and assistance of the physical therapist, the nurse in the hospital or home care program can help the patient maintain his muscle strength and endurance.

Circulation

According to Kottke, profound changes in circulatory control and performance occur whenever patients are confined to bed. To avoid the deteriorating effects of bed rest, patients should not be confined to bed any longer than is necessary to treat the primary disability. Bed exercises and increased self-care in daily activities may be prescribed to keep the uninvolved parts of the body active enough to prevent deterioration. Even for the patient with cardiac disease, carefully prescribed activity may help maintain the body without an undue load on the myocardium. Careful passive motion does not appreciably increase blood pressure or cardiac output and yet may be used to keep the body supple.

Also in regard to the patient with a cardiac condition, there has long been controversy whether or not the demand is lower when a person is lying supine or when sitting. Kottke's data indicate and support the contention that cardiac output when a person is sitting with the

Figure 7. Supporting armchair

feet dependent is slightly lower than when he is lying supine (*18*). Gordon has said that the sitting rather than the reclining position is basal. He indicated that this finding is at the root of the armchair treatment for coronary thrombosis. He further implied that the bedside commode entails a much lower energy cost than the use of the bedpan, a significant factor in caring for the bedbound patient (*19*).

Kottke has indicated that for bedbound patients, a change is a rest in that it allows relaxation (*18*). To move the patient carefully from a bed to a comfortably supporting armchair places him in a physical position of minimal heart work and also helps to relieve emotional tension (fig. 7). Therefore, sitting in the chair several times a day keeps the cardiac output of the patient closer to the minimal level than does absolute bed rest. Assistance in relieving emotional tension and anxiety might also be obtained through diversional activities such as occupational therapy crafts requiring only the use of hands.

Prevention of Decubiti

Care of the debilitated or helpless patient is usually a serious nursing care problem. In patients unable to turn themselves or those who have an area of analgesia so that pain is not present as a warning signal, ischemia may persist until an ulcer develops. Kosiak's studies indicate that areas subject to pressure may have considerable necrosis of the underlying tissue before the skin over the ischemic area breaks down. Decubiti are the result of excessive pressure times the duration of this pressure (*20*). To prevent a dangerous degree of ischemia, these patients should be turned not less than once each hour. The alternating pressure mattress mentioned by Kottke in the preceding article is an effective apparatus in which a 5-minute cycle automatically inflates the alternating plastic tubes. This change prevents prolonged ischemia. Even with the use of this mattress, it is helpful to continue to turn the patient at least every 2 hours if ischemia is to be prevented.

Discussion

Although it is well known and understood that the emotional factors observed in long-term illness are of the foremost importance when considering prevention of deterioration of the patient who is confined to bed, this paper is necessarily limited to the physical aspects of care. The preventive measures reviewed are well known to nursing, but emphasis has been placed on more diligent consideration of bedfast patients in terms of recent research findings related to patient care.

The nurse who is alert to the patient's continued needs may request certain prescriptions from the physician in order to carry out a maximum rehabilitative program for the bedfast patient. Communication and coordination with the physical and occupational therapy personnel will enhance the nurse's contribution. She will then be able to supplement and complement more capably the total program of care for the patient.

The prevention of complicating deformities and the maintenance of muscle strength and joint mobility in the bedfast patient is the crux of modern rehabilitation.

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Education Notes

Social Organization of Medical Care. The Florence Heller Graduate School for Advanced Studies in Social Welfare and the department of sociology, Brandeis University, conduct a doctoral program on the social, political, and economic aspects of preventing and treating diseases. The program includes courses on the social organization of medical care and research at the university and in public health and hospital settings.

Applicants must have completed a year of graduate work in sociology or of studies at the Heller School. U.S. Public Health Service fellowships are available. Inquiries should be directed to the dean of the Heller Graduate School or to the dean of the Graduate School of Arts and Sciences, Brandeis University, Waltham, Mass., 02154.

Summer Session of Epidemiology. The first cooperative graduate summer session on epidemiology, sponsored by the Association of Teachers of Preventive Medicine and the Epidemiology Section of the American Public Health Association, will be held at the University of Wisconsin from June 21 to July 30, 1965.

The intensive summer training program is intended to promote research programs in epidemiology and to further the use of epidemiologic techniques in the medical and public health professions. It is supported by a research training grant from the National Institute of General Medical Sciences, Public Health Service.

Introductory courses will be offered during the first 3 weeks and more advanced courses in a second 3-week session. Trainees may elect to take either or both sessions, depending on their qualifications and interest.

For further information, write to the Director, Summer Epidemiology Course, Department of Preventive Medicine, University of Wisconsin School of Medicine, Madison, Wis., 53706.

Care of Premature Infants. The Institutes for Physicians and Nurses in the Care of Premature Infants, New York Hospital-Cornell Medical Center, sponsored by the New York State Department of Health and the U.S. Children's Bureau, will begin their 17th year in the fall of 1965.

Five institutes are scheduled between September 1965 and May 1966. Attendance at each is limited to six physician-nurse teams. The sessions are 2 weeks in length for physicians and 4 weeks for nurses. Participants pay no tuition and stipends are provided to cover other expenses.

Early application for the institutes is essential since plans are contingent on the number received. For additional information write: Box 143, Institute in the Care of Premature Infants, New York Hospital, 525 East 68 Street, New York, N.Y., 10021.

Program Notes

Intensification of TB Services

A special Pennsylvania Health Department tuberculosis campaign is underway in Luzerne County under a Public Health Service grant.

It seeks to coordinate and increase activities of the various health agencies; emphasize the examination of close contacts to newly reported active cases and the use of indicated preventive drugs; tuberculin-test first-grade pupils and institute routine tuberculin testing in the State health department child health conferences; observe and follow persons known to be at special risk; and carry out screening programs in neighborhoods of high incidence and in areas of high reactor rates.

In 1963, 153 new tuberculosis cases were identified in Luzerne county, where anthracosilicosis (a disease prevalent among coal miners) compounds the tuberculosis problem.

Suicide Prevention in Utah

Plans are underway in Utah to establish a suicide prevention center for the Salt Lake City area. It is to be staffed by professional volunteers, including a psychiatrist, psychologist, social worker, and a psychiatric nurse. Suicide took 100 lives in the State in 1962; 9 murders (mostly of children) occurred in connection with these suicides. The Utah Professional Relations Committee and the Salt Lake Area Jaycees are sponsoring the center.

Foster Homes for Aged

"If I'd had to stay at the old-age home another month, I'd either have died or run away," said a 78-year-old Pennsylvania widow, speaking from the security of her foster home.

The woman is 1 of 20 aged Luzerne County, Pa., citizens benefiting from the county's senior citizens foster home program. Six Pennsylvania counties operate such programs. "There are at least another 1,000 aged in Pennsylvania who would greatly benefit from this type of care," said Herman M. Melitzer of the State office for the aging.

The widow's board and room is paid for by her old-age check ($91) and by county assistance ($34). Of these funds, the foster family receives $109; the rest is the widow's. The plan costs the county $2,087.60 a year less than when the woman was in a county old-age home.—*Parade Magazine*, Dec. 13, 1964.

Missoula's Self-Survey

To meet the needs of the chronically ill and aging that were revealed in a self-survey in Missoula, Mont., members of the citizen and professional committees and the area chairmen associated with the survey recommended the following:

1. Through such means as health education, do more with citizens in earlier years of life to prevent chronic illnesses; encourage earlier casefinding; plan for maximum use now of facilities providing advanced treatment methods to alleviate the crippling effects of chronic conditions.

2. Conduct a supplemental survey to determine services already available in Missoula which might fulfill needs indicated in the survey. (The Missoula Zonta Club and home demonstration groups subsequently started a compilation of agencies and organizations and the services each offers.)

3. Set up a central clearinghouse so that one call or visit will provide answers to necessary questions and referral to the appropriate agency or organization.

4. Step up publicity and promotion of the out-of-hospital nursing service instituted by the health department in July 1962. Investigate whether the service might be included in insurance coverage. (The survey indicated the nursing service was much needed but not fully used; the service could do much to alleviate the disabling effects of chronic illness and smooth the transition from hospital to home for all age groups.)

5. Consider instituting a community homemaker service. It could meet the need indicated by 15 percent of the age group older than 65 years for help with housework, as well as provide help for young mothers while in a hospital. (At a joint meeting of the committees and survey chairmen in January 1964, a subcommittee was appointed to study the details of financing and operating such a service.)

6. Consider establishing a club room or rooms for all older citizens, possibly by combining efforts of existing church and social groups; the facility might include equipment for shop and hobbies.

7. Provide more education in financial planning for retirement among younger age groups.

8. Place copies of the survey report in all Missoula libraries, making additional copies available in the local health department and the county extension office.

Single Agency to Combat Arthritis

The American Rheumatism Association, the Arthritis and Rheumatism Foundation, and the National Foundation-March of Dimes joined in 1964 to create a single, strong national voluntary agency to combat arthritis. The organization assumed the name of Arthritis Foundation.

Floyd B. Odlum, former chairman of the board of the Arthritis and Rheumatism Foundation, is chairman of the board of the new organization. Dr. William S. Clark, formerly director of the medical department of the National Foundation-March of Dimes and architect of that organization's nationwide network of arthritis study and treatment centers, is president.

Items for this page: Health departments, health agencies, and others are invited to share their program successes with others by contributing items for brief mention on this page. Flag them for "Program Notes" and address as indicated in masthead.