

2-1-1990

## Geriatric rehabilitation

Herman J. Flax

Follow this and additional works at: <https://digital.car.chula.ac.th/clmjournal>



Part of the [Medicine and Health Sciences Commons](#)

---

### Recommended Citation

Flax, Herman J. (1990) "Geriatric rehabilitation," *Chulalongkorn Medical Journal*: Vol. 34: Iss. 2, Article 2.  
Available at: <https://digital.car.chula.ac.th/clmjournal/vol34/iss2/2>

This Special Article is brought to you for free and open access by the Chulalongkorn Journal Online (CUJO) at Chula Digital Collections. It has been accepted for inclusion in Chulalongkorn Medical Journal by an authorized editor of Chula Digital Collections. For more information, please contact [ChulaDC@car.chula.ac.th](mailto:ChulaDC@car.chula.ac.th).

## Geriatric rehabilitation.\*

Herman J. Flax\*\*

Flax HJ. Geriatric rehabilitation. Chula Med J 1990 Feb;34(2): 95-102

*Not only is there the normal, general loss of body functions, but additional factors, mental and physical, related to the cause and effect of disability that influence the quality of life and life expectancy of the geriatric patient. Vegetative functions such as body temperature and blood volume tend not to change, whereas reduction in tissue mass such as of muscle and kidney and reserve functions such as pulmonary and cardiac reserves show more major declines. Multiple and functional deficits can lead to loss of independent living and increase the risk of injury which in turn is responsible for a large share of long - term care. Elimination of hazards and the dynamic involvement of all team professionals as well as family members without babying or feeling too sorry for the patient are some measures that will improve or modify impairments, disabilities and handicaps. The development of optimum life styles to modify deterioration in physiological functions may help as to attain a better life expectancy. A case of right hemiplegia from C.V.A. has been selected to illustrate the rehabilitation prescription.*

Reprint request : Professor, Physical Medicine and Rehabilitation, University of Puerto Rico, School of Medicine, Chief, Rehabilitation Medicine Service.117, San Juan VAMC, One Veterans Plaza, San Juan, Puerto Rico, 00927-5800, U.S.A.

Received for publication. October 15, 1989.

\* Presented to the Thai Rehabilitation Medicine Association, Bangkok, Thailand. August 11, 1989.

\*\* Professor, Physical Medicine and Rehabilitation, University of Puerto Rico, School of Medicine, Chief, Rehabilitation Medicine Service. 117, San Juan VAMC, One Veterans Plaza, San Juan, Puerto Rico, 00927-5800, U.S.A.

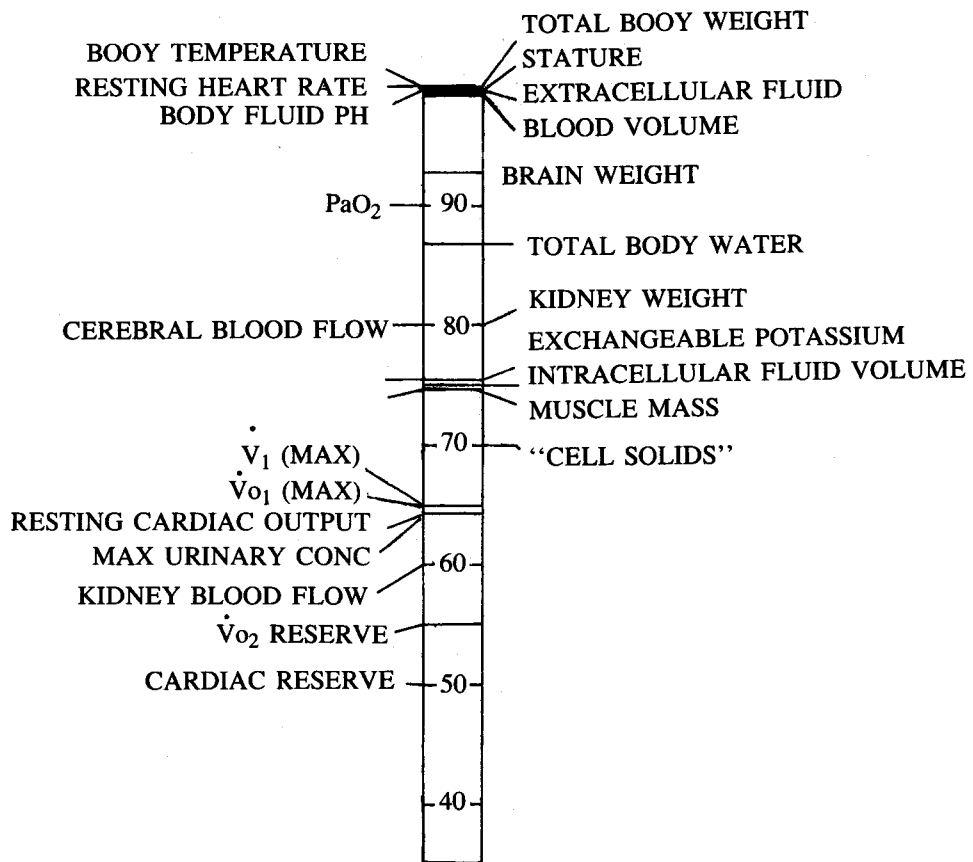
เซอร์แมน เจ แฟล็กซ์. การฟื้นฟูสมรรถภาพของผู้สูงอายุ. จุฬาลงกรณ์เวชสาร 2533 กุมภาพันธ์;34(2): 96-102

ตามปกติในผู้สูงอายุไม่เพียงแต่จะมีการเสื่อมคุณภาพของร่างกายโดยทั่วไปอยู่แล้ว แต่ยังมีสิ่งอื่น ๆ เสื่อมตามไปด้วย เช่น จิตใจ และร่างกายส่วนที่จะเป็นสาเหตุให้เกิดความพิการ ซึ่งจะมีผลต่อคุณภาพและความยืนยาวของชีวิตด้วย การทำงานพื้นฐานเพื่อให้ดำรงชีวิตอยู่ได้ เช่น อุดหนุนของร่างกาย ปริมาณเลือดในร่างกาย ไม่น้อยจะมีการเปลี่ยนแปลง แต่ในขณะที่เดียวกันจะมีการลดขนาดของอวัยวะต่าง ๆ เช่น กล้ามเนื้อ ไต และยังมี การเสื่อมเสียคุณภาพของการทำงานของปอด หัวใจอย่างมากด้วย การสูญเสียคุณภาพของอวัยวะหลาย ๆ อย่างอาจจะนำไปสู่การสิ้นสภาพของการมีชีวิตที่เป็นอิสระ และเพิ่มปัจจัยเสี่ยงต่อการบาดเจ็บ ซึ่งจำเป็นต้องมีการเตรียมดูแลผู้ป่วยกันเป็นระยะยาวนาน การระวังอันตรายต่าง ๆ และการปฏิบัติอย่างระมัดระวังกับผู้ป่วย จากหัตถุศาสตร์ทางการแพทย์หรือสมาชิกในครอบครัวผู้ป่วยเอง โดยมีให้ปฏิบัติต่อผู้ป่วยอย่างเด็กเล็ก ๆ หรือคอยเอาอกเอาใจมากเกินไป จะเป็นกุญแจสำคัญในการปรับปรุงแก้ไขความพิการของผู้ป่วยได้ การวิวัฒนาการให้การดำรงชีวิตอยู่ตรงจุดพอดีนี้เองจะเปลี่ยนแปลงหรือหยุดยั้งการเสื่อมสภาพของชีวิต และทำให้ชีวิตยืนยาวออกไปอีกด้วย ได้มีการยกตัวอย่างของคนไข้ที่เป็นโรคเส้นเลือดสมองตีบตันว่าจะต้องตั้งโปรแกรมการฟื้นฟูสมรรถภาพอย่างไรในบทความนี้

Depending on our genes, nutrition, and psychosocioeconomic circumstances, there are an abundance of physiological changes that govern our life span and curtail our activities as we grow older. Although not desirable, we accept them, because, truthfully, the only other alternative gives us no choice. Since we live in a society, we emulate our peers, and this is detrimental to our health, especially, if our friends and family eat too much, use alcohol and cigarettes excessively, don't exercise, and, in general, don't pay too much attention to risk factors. Nevertheless, the human life span continues to increase, and there are many nations whose average population reaches 75 years. Interestingly, in the most highly developed countries today, the ratio of women/men past 75 is 180/100. There is no question, if the number one killer, arteriosclerosis, could be conquered, the ratio would balance better, and we could forecast a life expectancy of 85. Also, as the other major causes of death are eliminated, and we develop optimum life styles to modify deterioration of our aging

physiological functions, we may hope to attain the magical biblical number of 120.

Kenny<sup>(1)</sup> has said, "Aging may be defined as the sum of all the changes that occur in man with the passage of time and lead to functional impairment and death. Changes tend to fall in three clusters: (1) some functions, typically those representing vegetable functions, that do not change, (2) a cluster dominated by reduction in active tissue mass, and (3) a cluster of reserve" functions that show a major decline. "The first may be represented by body temperature and blood volume; the second by loss of muscle mass and kidney weight; and, the third by reduction in pulmonary and cardiac reserve. An understanding of these physiological changes becomes more important in the prescription of a geriatric rehabilitation medicine program. Not only is there the normal, general loss of body functions, but there are now additional factors, both mental as well as physical, related directly to the cause and effect of disability that influence the quality of life as well as the life expectancy of the geriatric patient. (Figure 1)



**Figure 1.** Some anatomical and functional variables in a 70 year old man, expressed as a percentage of values in the young adult. From Kenny R A : Physiology of Agine. Chicago, Year Book Medical Publishers, ed. 2, 1989, pp 15-16. (Used with permission).

Fortunately, man and women are endowed with ample reserves that can guarantee an ever increasing life span provided we learn to check the relentless physiological deterioration of our body systems and overcome the stresses and strains that produce psychosomatic diseases. Peace and tranquility are not only utopian thoughts for philosophers, but they must become the touchstone for future generations in order to reach the venerable age of 120 years or even more.

## GERIATRIC REHABILITATION

We will consider measures that will improve or modify physical and emotional problems that result in impairments, disabilities or handicaps in the aged population. Some result from the loss of normal physiological functions, as we have just reviewed, and others from the consequences of disease. The physician attempts to restore all patients to their normal state of health. When this is not possible, he consults with the physiatrist in order to prepare a rehabilitation program that will train the patient to become self-sufficient or to be able to care for himself/herself in the most satisfactory way possible. The short and long term goals for the geriatric patient are different from the young adult. However, both encompass the basic philosophy of rehabilitation, to improve the quality of life for the individuals. In this respect, we can most assuredly echo the words of my revered and respected teacher, Professor George Morris Pierso, who said, "It is not enough that we add years to life, we must also add life to years."<sup>(2)</sup>

The World Health Organization published a manual in 1980, "International Classification of Impairments Disabilities and Handicaps",<sup>(3)</sup> that has attempted to classify and code the multiple health problem and deficiencies treated by rehabilitation medicine for the first time. These have been grouped under three dimensions: 1. Impairment. "In the context of health experience, an impairment is any loss or abnormality of psychological, physiological, or anatomical structure or function." Impairments represent disturbances at the organ level (part involved). 2. Disability. "In the context of health experience, a disability is any restriction or lack (resulting from impairment) of ability to perform an activity in the manner or within the range considered normal for a human being." Disabilities thus represent disturbances at the level of the person (whole body). 3. Handicap. In the context of health experience, a handicap is a disadvantage for a given individual, resulting from an impairment or a disability, that limits or prevents the fulfillment of a role that is normal (depending on age, sex, and social and cultural factors) for the individual."

Handicaps thus reflect Interaction with and adaptation to the individuals surroundings (social integration).

This classification identifies social, economic as well as physical problems associated with diseases requiring rehabilitation measures. An elderly amputee in addition to diabetes mellitus and its complications causing the amputation has: 1. The loss of a leg, an impairment; 2. Inability to walk, a disability; and 3. He cannot return to his job or go to the theatre, a mobility handicap, an economic self-sufficiency handicap, and a social integration handicap. Thus, treating the diabetes only is not providing the best medical care for this patient. The social and economic handicaps brought about by the amputation also must be solved.

Aging is not a disease, nor are there any disease exclusive to old age. There are, of course, many chronic diseases usually associated with the older population. There are generally the complications of illnesses, that are associated with the physiological changes of aging. Examples are hemiplegia, hip fracture and dementia. Another striking, preventable problem, that plagues us all, is the decomposition, deconditioning, and deformities found in the elderly who have been left alone to deteriorate in bed following an acute illness.

A Surgeon General's Workshop on Health Promotion and Aging held in 1988<sup>(4)</sup> pointed out the need for well-designed, controlled studies on the effects of preventive and rehabilitative strategies on physical functional capacities and injury risk and related sequelae in older persons. These include but are not limited to: 1. deficits in skeletal muscle strength, 2. deficits in gait speed, 3. limitations in joint range of motion, and musculoskeletal flexibility, 4. deficits in postural stability leading to falls, and 5. deficits in cardiopulmonary fitness.

These conditions contribute to significant functional limitations. Survey data<sup>(5)</sup> suggests that 15% of persons aged 75-84 are unable to climb stairs, 23% are unable to walk half a mile, 7% are unable to walk across a small room, and 24% are unable to lift ten pounds. A large number of otherwise healthy older persons have limitations in gait speed severe enough to prevent crossing street intersections before the traffic light changes.<sup>(6)</sup> Over 200,000 hip fractures in the U.S. each year occur among older persons, primarily as a result of osteoporosis and an increased risk of falling.<sup>(7)</sup>

The progression of these physical and functional deficits can lead to the loss of independent living and increased risk of injury. Also, when these physical deficits are combined with undesirable social,

behavioral or environmental conditions, the risk for injury, especially falls, rises. These deficits are responsible for a large share of the needs for long-term care, and also contribute to significant morbidity from injury and other consequences of activity limitation.

There is some evidence to indicate that several of these physical deficits in older persons can be prevented or reversed using rehabilitation measures. For example, a study published in 1984<sup>(8)</sup> indicates that exercise regimes can improve strength and mobility in older persons. Another study<sup>(9)</sup> suggests that exercise programs may retard the rate of age-related bone loss, increase cardiac fitness and improve glucose tolerance in older adults.

While the contribution of physical deficits to the risk of falling and related injuries is evident. There are, also, environment and behavioral factors involving the older patient and his family that must be recognized. Previous research suggests that a significant number of falls in the elderly could have been avoided by removing environmental hazards, e.g., loose rugs, unstable furniture poorly lighted areas, unsafe stairways. Even if environments are safe, lack of awareness of injury risk associated with reduced physical capacities and imprudent risk taking can increase falling and injury risk in the physical impaired geriatric patient. Conversely, older people may respond to changing physical capabilities with a fear of falling, leading to restrictions in physical and social activities, increased dependence on others, and reduced quality of life.<sup>(10,11)</sup>

The therapeutic and technical procedures used in the rehabilitation of the geriatric patient are essentially the same as those used in the general practice of rehabilitation medicine. The examining physician must be cognizant that the elderly usually have multiple medical problems and adjust the rehabilitation program accordingly. The normal physiological loss of functions, specially cardiopulmonary and musculoskeletal, may limit the therapeutic procedures and prolong the time of treatment, but these patients do achieve their rehabilitation goals with good results. Procedures must be carefully explained in accord with the proposed goals, and the staff must make sure that the patient understands each successive step in the rehabilitation program. The staff must be informed of the medical restrictions to treatment and should constantly observe the patients for any unwarranted complications that might interfere with progress. Older persons become confused easily and do not cooperate, especially if they do not understand the scope of therapy, and if these procedures produce pain or discomfort. Finally, it is essential to integrate rehabilitation modalities early into

the therapeutic regime and not wait until the patient has been left with multiple physical defects secondary to activity limitation even though the acute medical problem has been solved.

Modern medical technology tends to dehumanize patient-physician relationship, especially in the geriatric patients with chronic debilitating diseases that take up too much time and require prolonged rehabilitation medicine services. The physiatrist must become concerned with the clinical, psychosocial, and familial aspects of the geriatric patient in order to prepare a successful medical rehabilitation program. Above all, the physiatrist must be a good listener and pay attention to each and every complaint.

I studied medicine before the eras of the miracle drugs and the magnetic resonance imager. As a lowly intern, I followed my professor of medicine on ward rounds, eager to catch each pearl of wisdom that dropped from his lips. He would approach an elderly patient, hold his hand, look him straight in the eye with a beautiful smile on his face, and ask him a number of questions: first about his health, then his family, and finally, some chitchat about a ballgame or news event. He would sit on a chair or on the bed itself and always gave the impression that he was in no hurry to leave. Finally, he would ask the patient to comment on the treatment. If the patient complained of some minor problem or suggested some slight change, he would turn to the physician-in-charge and say, "Do it!" Only by listening, observing, and evaluating patients frequently, are you able to pick-up problems related to poor vision or hearing, drug overdose, poor nutrition, and early signs of depression.

The older patient is fearful of his disease and even more afraid of dying. The entire rehabilitation team must offer encouragement and instill hope at all times. Therefore, it is important to start with simple short-term goals that are easily attainable in order to stimulate the patient. As soon as possible, it is essential to involve the family members in the patients care. They must understand the disease and its prognosis, be fully aware of all the body limitations and cognizant of the staff's expectations. The family must be taught to be very patient, not to help patients do things they have been taught to do for themselves, not to baby or to feel sorry for them, always to inspire hope.

Successful rehabilitation of the geriatric patient requires a cooperative and dynamic involvement of all the team professionals. The physician points out the limitations imposed by the patient's diseases and the consequences of these diseases in addition to the loss of functions in the involved and other body systems

related to the age factor. The nurse briefs the team about medication, bowel and bladder habits, hygiene, feeding, social integration and other nursing routines in the ward. The physical therapist provides objective measurements of muscle strength and range of joint motion, the baseline for measuring improvement of the musculoskeletal system. The occupational therapist reports on sight and hearing as well as proprioception sense, on the functional ability of the musculoskeletal system, but, more important supplies an objective measurement of the ability of the patient to perform the functional activities of daily living. The social worker contacts the family, ascertains the social and economic conditions and reviews the home environment. The psychologist evaluates the mental status and tells us whether the patient is educatable. The nutritionist prepares a diet if necessary, the prosthetist, an artificial limb, and the orthotist, splints or braces. Other ancillary medical specialists are consulted as needed, the speech pathologist and the audiologist as well as additional medical-surgical specialists. After the patient has been studied completely, an initial evaluation meeting is held by the team, and a rehabilitation medicine prescription is written, taking into consideration the physical and emotional limitations produced by the disease and its consequences and the physiological functional losses of aging. Short-term goals are formulated, and provisional long-term goals are conceived in accord with the actual state of health, medical prognosis, and past experience of the team members.

## THE REHABILITATION MEDICINE PRESCRIPTION

The patient has been evaluated by the members of the rehabilitation team, and we are now ready to write a rehabilitation medicine prescription. I have selected "stroke" as our example, because this disease is the leading cause of neurologic disability in the U.S.A. and is also a major cause of long-term disablement. It presents an impediment, paralysis of an extremity, sometimes aphasia; a disability, involvement of multiple body systems, brain, vision, muscles, speech; and, a handicap, changes in socioeconomic circumstances that disadvantage the patient in the home, community and place of employment.

The short-term rehabilitation goals are:  
1. Prevention of deconditioning, 2. Prevention of contractures, 3. Improve sitting and standing balance.

Long-term goals are: 1. Ambulation with or without a brace, 2. Independence in self-care, the

functional activities of daily living: hygiene, dressing, feeding, communication, with or without adaptive equipment or assistance. Vocational Rehabilitation<sup>(2)</sup>.

One week ago, a 60 year old male, suffered a cerebral vascular accident (CVA) from a thrombosis of the left medial cerebral artery that has left him with a right hemiplegia and hemianesthesia, a homonymous hemianopsia, and a motor aphasia. He has diabetes mellitus with hypertension, arteriosclerosis and benign prostatic hypertrophy.

After deliberation, the team prepared the following prescription, which was countersigned by all the members of the team:

1. The nurse will oversee proper bed posture to prevent drop-foot by resting the right foot flat against a foot-board in bed, placing sand bags along the outside of the thigh and leg to prevent external rotation of the right lower extremity, support the right arm in abduction and external rotation by means of pillows and place the hand above the level of the heart to prevent edema and grasping a bandage roll to stimulate proprioception.

2. The physical therapist will provide passive range of motion to the paralyzed extremities by carrying each joint through complete range of motion. At the same time, she will stimulate function by focusing the patient's attention on the paralyzed segments. The physical therapist also works to develop strength in the uninvolved extremities through active, resistive exercises, so they can begin to substitute for the lost functions. These activities are associated with sitting balance, wheelchair transfers from bed to wheelchair and viceversa, standing balance, and, ultimately, ambulation. Walking follows and includes, as necessary, stairs, ramps, rough ground, and public transportation. The physical therapist teaches the patient and the family stretching maneuvers and exercises to prevent contractures and deformities of the joints, especially the shoulder, wrist, fingers, hip and ankle.

3. The occupational therapist will develop the patient's independence in the functional activities of daily living: personal hygiene, dressing, writing, eating and, as necessary and appropriate, homemaking and possibly driving skills. Adaptive equipment may be used when necessary and suggestions made regarding home modifications to encourage independence. The occupational therapist prepares splints for the hand and wrist as necessary to prevent contractures and assist hand function.

4. The clinical psychologist is requested to evaluate the patient's intellectual ability and his capabilities for learning and possible reincorporation

into employment, either his old job or in a new endeavor. Although all the members of the rehabilitation team can provide some insight into alterations of cerebral function, it is the psychologist who certifies this capacity.

5. The social worker is asked to keep the patient's family cognizant and involved in the patient's rehabilitation program and the team informed of the home environment and socioeconomic benefits available to the patient. The social worker is in liaison between the family and the rehabilitation staff and is most helpful in arranging for the discharge and follow-up at home.

6. If the patient requires braces, shoe modifications or metal splints, these are ordered from the orthotist, who takes the measurements and manufactures the device in accord with the physiatrist's prescription.

7. Since our patient is a diabetic, a special diet is necessary. Once the total caloric value has been decided, the nutritionist is called in to prepare a diet, which should be simple and flexible for this 60 years old man.

8. The speech therapist is an important member of the rehabilitation team for this patient who cannot speak. The therapist diagnoses the type of aphasia and provides a specific program of speech therapy. In addition, the family members receive instruction in procedures to assist the patient in recovery of speech.

9. In our society, it is the rare, elderly, handicapped patient who will require the services of a vocational counsellor since most become pensioned and do not return to gainful employment. In so far as possible, the rehabilitation team stimulates the self-

employed, be they farmers or shop keepers, to return to their job. If this is possible, the social worker makes contact with the employer and personnel officer.

10. The family participates in the preparation of the prescription through contact with the physiatrist, social worker, nurse, and physical and occupational therapists. The input of the family and their cooperation is very important in the total management of the patient.

11. Consultation with other specialists is necessary. For this patient, a visit to the oculist and urologist is in order, and their respective recommendations are incorporated into the overall treatment program.

As additional problems arise, the therapeutic regime is modified to accommodate them. Rehabilitation Medicine is without a doubt a problem oriented-medical program. If there are no emergencies or complications, the team reevaluates the patient every two weeks, at which time a complete progress note is written by each team member. At this time, the rehabilitation prescription is altered in accord with the new findings until the patient is ready for discharge. The final prescription includes written instructions for the patient and the family in order to continue with the activities and exercises at home. If the patient is unable to return to the hospital for follow-up, a nurse and/or a physical therapist will visit the home to check the patient regularly, at least once every two or three weeks, on the Hospital-Based-Home-Bound program.

This is the extent of therapy offered by the Rehabilitation Medicine Service of the San Juan Veterans Administration Hospital in Puerto Rico. We treat our elderly patients with a large dose of tender loving care as we maximize their abilities and add life to their remaining years.

## References

1. Kenney RA, Physiology of Aging. 2<sup>nd</sup> ed. Chicago : Year Book Medical Publishers, 1989.
2. Piersol GM. In : Rusk HA, ed. A World To Care For. New York : Random House, 1972. 232
3. World Health Organization. International Classification of Impairments, Disabilities, and Handicaps. Geneva : WHO, 1980.
4. Surgeon General's Workshop on Health Promotion and Aging. Washington DC. U.S. Department of Health and Human Services, 1988. 63-9
5. Jette AM, Branch LG. The Framingham disability study. II. Physical disability among the aging. Am J Public Health 1981 Nov; 71 (11) : 1211-6
6. Lundgren-Lindquist B, Aniansson A, Rundgren A. Functional studies in 79-year-olds. III. Walking performance and climbing capacity. Scand J Rehabil Med 1983 : 15 (3) : 125-31
7. National Center for Health Statistic : Health Statistics on Older Persons, United States, 1986. DHHS Publication No (PHS) 87-1409. Washington DC, US Government Printing Office, 1987.
8. Vallbona C, Baker SB. Physical fitness prospects in the elderly. Arch Phys Med Rehabil 1984



- Apr; 65 (4) : 194-200
9. Smith EL, Smith PE, Gilligan C. Diet, exercise and chronic disease patterns in older adults. Nutr Revs 1988; 46 (1) : 52-61
  10. Radebaugh TS, Hadley E, Suzman R, eds. Falls in the elderly : biological and behavioral aspects. Clin Geriatr Med 1985; 1 : 497-697
  11. Gibson MJ. The prevention of falls in later life. Dan med Bull 1987; 34 Suppl No 4 : 1-24