PREVENTION

Deconditioning in the Hospitalized Elderly

IT IS CRITICALLY IMPORTANT TO IMPLEMENT STRATEGIES EARLY IN THE HOSPITAL STAY TO MAINTAIN AND IMPROVE FUNCTIONING IN ELDERLY CLIENTS.

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Mrs. R, an 83-year-old retired teacher, was living independently in her home when she developed symptoms of an upper respiratory infection. Initially she treated herself, but the symptoms progressed to include chills, fever, shortness of breath, pleuritic pain and a non-productive cough. When Mrs. R's daughter visited, she was alarmed to see her mother in this deteriorated state and showing signs of agitation and altered mentation. Mrs. R was admitted to the local acute care facility and treated for bacterial

ABSTRACT

Deconditioning is a complex process of physiological change following a period of inactivity, bedrest or sedentary lifestyle. It results in functional losses in such areas as mental status, degree of continence and ability to accomplish activities of daily living. It is frequently associated with hospitalization in the elderly. The most predictable effects of deconditioning are seen in the musculoskeletal system and include diminished muscle mass, decreases of muscle strength by two to five per cent per day, muscle shortening, changes in periarticular and cartilaginous joint structure and marked loss of leg strength that seriously limit mobility. The decline in muscle mass and strength has been linked to falls, functional decline, increased frailty and immobility.

The authors describe a three-pronged strategy to combat deconditioning that includes a model of care appropriate to the growing population of elderly clients, the creation of an "elder-friendly" hospital environment and an exercise program.

KEYWORDS: deconditioning, elderly, gerontology

PHOTO FIRSTLIGHT

pneumonia, hypoxia, dehydration and confusion. She recovered from the pneumonia, but many untoward events resulted from her hospitalization. Her first night in hospital, as she attempted to get out of bed to use the washroom, she fell. Staff members were upset with Mrs. R and instructed her to stay in bed unless she was accompanied by a nurse. Subsequently, not wanting to bother the nurses, she became incontinent and was rarely out of bed during her hospital stay. The staff were busy and did not always explain procedures to her or introduce themselves when they interacted with her. Nor did the staff engage Mrs. R's daughter in her mother's care. Mrs. R began to withdraw into herself, and eventually began the downward spiral of deconditioning associated with hospitalization in the elderly. Mrs. R was unable to be discharged home and is now awaiting placement in an assisted living facility. The story of Mrs. R is a discouragingly common one in today's hospital setting.

Deconditioning is a complex process of physiological change following a period of inactivity, bedrest or sedentary lifestyle. It results in functional losses in such areas as mental status, degree of continence and ability to accomplish activities of daily living (Brand et al., 2003). It can occur gradually or acutely, depending upon the degree of inactivity.

Deconditioning is frequently associated with hospitalization in the elderly and may occur after as little as two days of bedrest (Hirsch, Sommers, Olsen, Mullen, & Winograd, 1990). The most predictable effects of deconditioning are seen in the musculoskeletal system and include sarcopenia or diminished muscle mass, decreases of muscle strength by two to five per cent per day, muscle shortening, changes in periarticular and cartilaginous joint structure and marked loss of leg strength that seriously limit mobility. The decline in muscle mass and strength has been linked to falls, functional decline, increased frailty and immobility.

Many elderly who are living independently at home are at the threshold of strength required to perform the activities of daily living essential to their independence (Lazarus, Murphy, Coletta, McQuade, & Culpepper, 1991). As part of the normal aging process they experience a decrease in muscle strength and a decline in activity, leading to weight gain. These changes, combined with other factors such as deteriorating vision, balance and coordination, result in greater risk for falls.

Hospitalization, with its imposed restrictions on activity, accelerates the loss of muscle mass and strength. Furthermore, the unfamiliar surroundings and the common occurrence of delirium in the ill elderly, combined with the effects of deconditioning, can lead to disastrous outcomes for hospitalized elderly people such as Mrs. R.

Proactive strategy

The mechanism that leads to deconditioning is uncertain, although a number of studies suggest that it occurs after several days of bedrest (Fiatarone et al., 1990). In combination with the low levels of muscle strength and functioning that pre-exist in many hospitalized elderly, deconditioning may lead to dependency in walking and other activities of daily living. Consequently, it becomes critically important to implement strategies early in the hospital stay to maintain and improve functioning in elderly clients. One useful strategy takes a three-pronged approach that includes a model of care appropriate to the growing population of elderly clients, the creation of an "elder-friendly" hospital environment and an exercise program.

Model of care

The prevention of deconditioning requires rethinking the way we deliver services to the hospitalized elderly. The care model demands expert knowledge of both the age-related needs and the disease-related needs of the elderly. It requires redesign of the work of nurses to focus on early and ongoing assessment of elderly clients and the planning of care by RNs to promote functional mobility in this population. However, current literature sources suggest that nurses are not prepared to assume this role. Recently, King noted that there is a trend toward uninformed care of older adults (King, 2004). She suggests that much of today's care for the hospitalized elderly is provided by nurses who graduated from programs before the inclusion of gerontology as part of the core curriculum. Baumbusch and Andrusyszyn (2002), in a review of gerontological content in undergraduate Canadian nursing curricula, support this claim. ›

ONE USEFUL STRATEGY TAKES A THREE-PRONGED APPROACH THAT INCLUDES A MODEL OF CARE APPROPRIATE TO THE GROWING POPULATION OF ELDERLY CLIENTS, THE CREATION OF AN "ELDER-FRIENDLY" HOSPITAL ENVIRONMENT AND AN EXERCISE PROGRAM

GERONTOLOGICAL CONTENT AND EXPERIENCES MUST BECOME CORE TO THE EDUCATIONAL PREPARATION OF HEALTH PROFESSIONALS

A new model will require improved knowledge and skill for all health-care workers, including nurses, physicians, pharmacists and physiotherapists, as well as family members and the clients themselves. Gerontological content and experiences must become core to the educational preparation of health professionals. Geriatric experts who specialize in the care of the elderly may act as resources to the health team, but their expertise is not enough. All health-care professionals, especially nurses, need to develop proficiency in this area.

Creditor (1993) calls for an interdisciplinary care model, but emphasizes the need for continuity of nursing care. He suggests that just as the attending physician is responsible 24 hours a day for a set of patients, so must there be a nurse with a similar relationship to the hospitalized elderly client. This model will take on increasing importance if we follow the trend of using less skilled caregivers for the delivery of direct care to elderly clients and subsequently place more responsibility and accountability on individual RNs for the planning and coordination of care for specific patients from admission to discharge. Such changes will require an aggressive plan of continuing education for all caregivers, including education on the normal aging process, ways to promote independence in the hospitalized elderly and ways to prevent and treat deconditioning and its associated consequences. Strategies to encourage family participation in care are needed. The involvement of family members in mealtimes or exercise periods can contribute to continuity of care for the elderly client and enable family to make a meaningful contribution to the patient's recovery.

Modification of the hospital environment

An important intervention to prevent deconditioning in clients such as Mrs. R is to modify the hospital environment in ways that make it user friendly. Nurses can advocate for such changes as the design of continual walking paths within hospital units to allow clients to maintain mobility while staff can monitor the distance walked. The replacement of high hospital beds with modified geriatric beds can prevent injuries. Most elderly clients do not fall out of bed; rather, they are injured as Mrs. R was when she attempted to get out of a high hospital bed to use the washroom in an unfamiliar environment. Soft, non-slip floor surfaces such as cork or rubber enable safe footing, are easily maintained and reduce the impact if a fall is sustained.

Day rooms supplied with books, comfortable chairs, plants, gardening facilities and appropriate leisure time activities promote socialization and orientation. Clients should be encouraged to get dressed in their own clothing and visit these areas as much as possible. Communal eating facilities provide holistic therapeutic benefits that enable clients to remain engaged with their environment. Walking to and from communal eating areas is a functional exercise that has physical and social benefits for elderly clients. Proper lighting, the use of night lights in patient areas and ease of access to room lights assist the elderly in familiarizing themselves with their new environment and promote functional mobility.

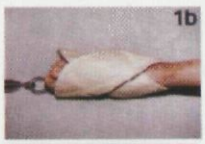
Exercise programs

Preventive exercise programs for the elderly are crucial. The types of exercise appropriate for elderly clients should be determined in consultation with the individual client and the client's nurse, physician and physiotherapist. Factors to be considered include the client's acuity of illness, mobility status, level of cognition and functional ability in activities of daily living, as well as the dynamic balance between the client's assets and deficits. An exercise program should meet the overall goal of preventing disability and preserving functional ability.

Five principles should be considered in planning an exercise program. First, a medical evaluation may be necessary to determine if acutely ill clients can safely comply with the program. Second, in general, physical activity is better than no physical activity. Third, costly exercise equipment is not available on most hospital units, so it is important to select exercises that enable one to maintain the integrity of the exercise program without the use of equipment. Fourth, the exercises should be adapted such that they may be performed in bed. Finally, strengthening exercise programs need to provide enough resistance to train muscles while maintaining safe, correct posture and positioning.

Exercise types include strengthening, endurance, functional, balance and flexibility. Of these, the most comprehensively studied in the elderly have been strengthening exercises. (See Table 1 for a hospital-based resistance exercise program.) Strengthening exercises (or resistance exercises, as they are commonly referred to) have acceptable levels of compliance, have few side-effects and have shown consistent gains in strength in multiple studies (Fiatarone et ›

Table 1: Resistance exercise regimen

Exercise	Goal	Technique
Single leg extension 	To strengthen the quadricep muscles while maintaining proper alignment of the hip, knee and ankle	1. Place the legs over a half barrel. 2. Place a weight on the ankle at about 70 per cent of one RM[a]. 3. On exhalation, while keeping the upper leg on the barrel, extend the knee of the leg to a fully lengthened position. 4. Lower the leg on the inhale.
Heel drag  	To strengthen the hamstring muscles	1. Wrap a sling in a figure 8 around the foot and ankle, such that a small ring is positioned at the heel (Figure 1b). 2. Attach one end of a spring to the ring. 3. Attach the other end of the spring to the bed in line with the median sagittal plane of the leg and at a distance that will achieve muscle fatigue after 10 repetitions. 4. Have the patient lie in a supine position with the working leg flexed at a 110-degree angle and the resting leg extended. 5. On exhalation, activate the gluteal and hamstring muscles and move the foot as close to the buttock as possible.
Bilateral leg extension 	To strengthen the abductor muscles of the thigh and the pelvic muscles	1. Lie supine with legs over the barrel and the pelvis in a neutral position with a four-inch piece of foam between the knees. 2. To activate the thigh muscles, squeeze the foam, then simultaneously extend both legs on the exhale. 3. Return to the starting position on the inhale.
Plantar flexion 	To strengthen the muscles used for plantar flexion	1. Have the patient wear a shoe with a rigid bottom. 2. Choose a length of Thera-Band[b] that will fatigue the plantar flexor muscles after 10 repetitions. Place the middle of the Thera-Band around the sole of the shoe and hold the two ends of the Thera-Band. 3. Plantar flex the foot on the exhale and return to the starting position on the inhale.
Dorsiflexion 	To strengthen the muscles used for dorsiflexion	1. Attach a nylon circular band to one end of the spring. 2. Loop the band around the top of the foot, and then attach the other end of the spring to the bottom of the bed at a distance that provides enough tension to fatigue the muscle. 3. Dorsiflex the foot on the exhale and return to the starting position on the inhale.
Side-lying diamond 	To strengthen the thigh and gluteal muscles and lateral rotators of the hip	1. Have the patient lie on the side with shoulders, pelvis and trunk perpendicular to the bed, the hips and knees flexed at a 45-degree angle and the heels together. 2. On exhalation, press the heels together, and then open the top leg to make a diamond shape. 3. On inhalation, return to the starting position.

[a] RM = repetition maximum, the maximum amount of weight an exerciser can lift while maintaining correct position. The resistance for single leg extension is based on the one repetition maximum (1RM), calculated using one-pound increments. Once exercising, single leg extension is performed using 60-80 per cent of the 1RM.

[b] Thera-Band® is a type of rubber tubing used for resistance. For each patient, the physiotherapist should measure the length of tubing required to create muscle fatigue within 10 repetitions. Nurses should consult with the physiotherapist to establish the exercise program and determine appropriate weights and length of Thera-Band.

Adapted with permission from Mallery, L.H., MacDonald, E.A., Hubley-Kozey, C.L., Earl, M.E., Rockwood, K., and MacKnight, C. (2003). The feasibility of performing resistance exercise with acutely ill hospitalized older adults. Retrieved May 1, 2005, from http://www.biomedcentral.com/1471-2318/3/3

al., 1990, 1994; Mazzeo et al., 1999).

King (2004) challenges nurses to "advocate strategically and vigorously for older adults and our profession by bringing the issue [of the status and standards of care for older adults] to the fore." Let us reflect for a moment on how the outcomes for Mrs. R. might have differed if nurses were up to King's challenge of advocating for excellent care for the elderly. If there had been one nurse responsible and accountable for the 24-hour planning and coordination of Mrs. R's care, and if that nurse was knowledgeable about the special needs of the hospitalized elderly and had conducted a comprehensive early assessment, Mrs. R's initial fall might have been prevented. Perhaps Mrs. R could have felt a greater sense of comfort and control of her environment if the hospital had been equipped with geriatric beds, cork flooring and accessible night lights, and if she had been assisted to use the marked hospital walking paths to the find her way to the communal dining area and social room. Perhaps the downward spiral of deconditioning could have been minimized for Mrs. R. if staff on the unit had specialized knowledge of the cascading effects of deconditioning in the elderly. Perhaps Mrs. R. could have been discharged home if an interdisciplinary approach had included the development of an exercise program that would have allowed Mrs. R to maintain her mobility status and prevent deterioration of muscle strength. Last but not least, perhaps Mrs. R. would have remained continent, alert and socially engaged with her world if staff had called her by name, included her and her daughter in the plan of care and encouraged her to participate in day room activities with other elderly clients.

"TEACH US TO LIVE THAT WE MAY DREAD UNNECESSARY TIME IN BED. GET PEOPLE UP AND WE MAY SAVE OUR PATIENTS FROM AN EARLY GRAVE"

– R.A.J. ASHER

The story of Mrs. R highlights the need for everyone on a unit to be informed about the unique care requirements of elderly clients. The nurse, as the coordinator and planner of care, can work with the interdisciplinary team to contribute to excellent care for the fastest growing segment of the population. Good care includes strategies to prevent deconditioning and restore clients to their maximum level of functioning such that they may return to their pre-hospital state. ◆

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