Management of Functional Disability in Homebound Patients

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Five percent of the population aged over 65 years, or more than 1 million people, are homebound. Musculoskeletal dysfunction is the final common pathway of all forms of arthritis and many neuromuscular disorders and is the prime cause for being homebound. The US health care system, with its emphasis on acute illness, does not address adequately the functional problems of homebound patients. Many can be helped by modification of the home environment or physical and occupational therapy. This paper outlines the diagnosis and management of common functional disabilities found in homebound patients.

Five percent of the population aged over 65 years, or more than 1 million people, are homebound. In this group, musculoskeletal disorders and arthritis are the most common causes for being homebound.[1-3] Since 1980 the Multipurpose Arthritis Center has been working with four Boston area home care programs to evaluate the benefit of stepped-up rehabilitation and social support services for homebound patients.[4] Fifty-seven patients in the study had musculoskeletal impairments, 90 percent of them related to lower extremity function or gait, and 80 percent related to difficulties transferring from the bed, toilet, or chairs (Table 1).

The final common pathway of all forms of arthritis, musculoskeletal disorders, and many neurological disorders is musculoskeletal dysfunction. To maintain and improve a person's independence and ability to care for himself, functional problems not treatable by medication or surgery may benefit from modification of the home environment and occupational and physical therapy.

The present health care system, with its emphasis on acute illness, curative medicine, and technology, does not address such needs of the homebound. Home services are poorly integrated or staffed. Equipment for the improvement of function, such as raised toilet seats and toilet rails, is not generally reimbursable except by Medicaid.[5] Physicians who are primary providers of care for elderly patients may have little or no formal training in the care of homebound patients or familiarity with the types of interventions and services available for such patients.[3,6-8] This paper outlines the diagnosis and management of the common functional disabilities found in homebound patients.

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Diagnosis of Functional Impairment

Physicians often focus on disease activity as measured by objective tests to the exclusion of

Table 1. Causes of Musculoskeletal Functional Incapacity in 57 Homebound Patients

Diagnosis	Number of Patients
Osteoarthritis	
Knees	9
Spine	5
Back	1
Rheumatoid arthritis	5
General weakness or loss of joint mobility	20
Neurological diseases	
Cerebral vascular accident	4
Parkinson's disease	2
Multiple sclerosis	2
Freiderich's ataxia	1
Cerebral palsy	1
Triplegia	1
Amputation	3
Other	3

assessing how the disease affects the functioning of patients.[6] Functional impairment must be recognized to be managed. A formal functional evaluation may take 45 minutes or longer, especially for elderly patients with hearing and visual problems. An assessment tool requiring minimal training and only a few minutes to administer, good for screening for potential functional difficulties was designed. The patient is asked to imitate the examiner (Table 2). Ability to perform the maneuver as well as difficulty, pain, or discomfort during the maneuver is noted. Because self-reporting of function may be unreliable, the patient should be observed in his usual setting engaged in common activities.

Maintaining a patient at home requires support from family or friends. Patients in institutions differ from homebound patients in that they lack social supports. Thus, caring for homebound patients requires attention to their caregivers, providing emotional support and reliable backup in the event of emergencies. A home visit is both the symbol and the act of this attention, a source of comfort to the patient and his family.

Making a house call has its own special pleasures and rules.[9] The home, unlike the clinic or office, is the patient's domain, and the health care provider is the visitor. Many homebound patients set limits on treatment and help they will accept, perhaps as a positive gesture in retaining some control over their lives. Respecting the patient's "turf" is crucial in caring for the homebound patient.

Case 1

A 92-year-old woman with severe rheumatoid arthritis lives in a second-floor apartment with her younger sister. They like to sleep late and watch soap operas on television and, thus, home visits have to be scheduled around these activities. The patient "rocks" to get up from chairs and "flops" to sit down. Her transfers from bed were painful and extremely difficult until blocks to raise the bed were added. Raising her kitchen chair allowed her to sit down to eat, but she refused any bathroom equipment, preferring to stand while using the toilet. Suggestions for footwear and walker adaptations were also rejected.

Establishing Treatment Goals

Functional ability is dependent upon good joint motion, adequate muscle strength, and intact neurological pathways. About one third of homebound patients having difficulty with various tasks do not recognize the difficulties as being deficits that require attention.[4] The slow deterioration of function, the lack of competing activities, and the constrained universe of homebound patients may explain to some extent this lack of recognition and motivation to change.

First the clinician needs to negotiate realistic treatment goals by asking the patient what he or she would like to be able to do better; then the clinician reinforces this goal or guides a patient toward a series of successive goals that are simple, making it possible to build on success.

For example, a patient homebound for five years may wish to walk around the block. The clinician observes the patient has mild flexion contractures of the hip and knee, diminished strength,

Table 2. Screening for Functional Disability (Rhythm, Pain, Ability)

Landmarks	Musculoskeletal Areas Tested	Self-Care Areas Affected
Touch first metacarpal phalangeal joint to top of head	Shoulder, abduction, flexion, external rotation, elbow flexion	Face, neck hair, oral hygiene, feeding, dressing
Touch waist in back	Shoulder internal rotation	Dressing
Place palm of hand to contralateral trochanter	Wrist flexion	Perineal care
Touch fingers to palmar crease*	Small joints, flexion	Grip
Touch index finger pad to thumb pad	Opposition of thumb finger abduction	
Sitting, touch toe of shoe	Back, hip, knee flexion, elbow extension	Lower extremity dressing
Get up from chair without using hands**	Hip girdle strength, quadriceps strength	Transfer ability
Stand unassisted, step over 6-in block, gait	Hip, knee, ankle subtalar flexion and extension, small joints of feet, quadriceps strength	Walking, stairs

*If abnormal, test grip strength; lateral pinch strength is last to go
**If abnormal, test ability to get up from bed

and lack of confidence in his ability to walk. Although it is possible that the patient could go outside, the preferred approach might be to see whether the patient would do the exercises to correct his contractures and improve stamina and, if that is successful, to work on gait training in preparation for more independent walking.

Many functional problems of the homebound patient can be improved with walking aids, devices that assist with daily activities, or modifications of the home or furniture. Changes in long-standing habits are not easily made. A number of prescribed aids and devices remain unused because the physicians' or nurses' priorities were not those of the patient or because the devices were inappropriate. For instance, walkers can be more of a hindrance than a help in a cramped room or a hazard if improperly adjusted. Walking aids must be properly fitted, and their use must be observed. Whenever possible, existing furniture or household items should be modified or adapted rather than new equipment bought.

Specific Management Strategies

Transfer Problems

Eighty percent of homebound patients studied had difficulty getting in and out of chairs and on and off toilet seats, having to "flop on" and "rock

off'' seats. Weak hip and knee musculature, poor balance, and loss of adequate hip, knee, and ankle motion are a few reasons causing transfer problems. Difficulties with transfer can be aided by building up the height of the chair with cushions or by using hollowed-out wooden blocks under the legs of chairs.

Raised toilet seats are useful, but may present a minor inconvenience to other family members. Rails attached to the toilet or wall will help. Many of the elderly, because of weak quadriceps, pull themselves up using the sink or towel rack, which may not be secure. Where possible, a bar should be attached to the wall nearest the toilet to provide additional leverage and stability. As the bathroom is a site of frequent falls, toilet and tub transfers should be observed.

Getting in and out of bed can be very difficult for older persons with hip, knee, or back problems. The method of getting in and out of bed (under the covers, not just on top) as well as maneuvers to change position once in bed must be observed. A variety of home adaptations, including the use of an adjacent door or a strap attached to a radiator, are devised by patients or their families to facilitate getting in and out of bed. Raising a bed by 2 to 4 inches makes standing up easier for those with weak or stiff knees, but it may make sitting down more difficult if the hips lack flexion. A lowered bed aids shorter people in getting both on and off. Bed mobility may be improved by adding a bedboard or by getting a firmer mattress. Attaching a sturdy cord to the headboard allows a person to pull himself into the center of the bed. A trapeze can be used to pull oneself up in the bed, but this requires a major purchase or rental. Patients frequently devise their own techniques for bed mobility, and if these are satisfactory, the clinician need not suggest a more traditional alternative.

Case 2

An 85-year-old woman with bilaterally fused hips from previous inflammatory arthritis pulls herself onto the four-poster bed with the aid of a belt attached to the headboard. She gets out of bed by wiggling on her back to the edge of the bed so that her knees extend over the side and digging a cane into the mattress to thrust herself upright.

Gait Problems

The difficulty in walking, observed in 90 percent of homebound patients studied, can be caused by a number of factors. Seeing, hearing, and proprioceptive deficits, kyphoscoliosis, soft-tissue contractures, and general debility may all contribute to decreased confidence and endurance in walking.[10] Treatable causes of gait disturbances include hip or knee contractures, which are frequent problems in sedentary patients or those with joint pains of any cause. Soft-tissue contractures can be reduced through proning, active exercise, and assisted exercise. General conditioning and maintenance of mobility and joint function in aged persons without active arthritis is best accomplished by frequent repetitions of normal activities such as walking or rolling over in bed, or by simple exercises such as raising the arms and straightening the legs.

Proning (ie, lying on the stomach), although a good exercise for reducing hip and knee contractures, can be difficult for patients with cervical spine disease or pulmonary problems. For this reason, the person's ability to attain this position and to resume his original position should be observed before it is attempted alone.

Many people who have walking difficulties develop their own ways of ambulating. Their methods should not be discouraged unless they are unsafe. A patient is more likely to stick to his own habits than to follow the advice of someone else unless a new method is recognized as simpler. Since many apartments are compact, holding on to the wall molding, shelves, or chairs may be safer than using a walker.

Case 3

A 93-year-old man with poor vision and difficulty walking lives with his wife in a $2^1/_2$-room apartment. Although he was given a four-pronged cane, he never uses it because he found it difficult to handle. Instead, he leans on the furniture. At night, he arranges a row of chairs to act as a guide between the bed and the toilet.

Walkers, canes, or crutches should be used only when they can be handled safely. The two problems most commonly encountered in their use

are improper height and lack of instruction. When these devices are properly adjusted, the user's elbows should be almost completely straight. The standard pick-up walker is useful for patients with balance problems or general lower extremity weakness. The reciprocal walker, which is used for severe balance or weakness problems, is hinged in the center allowing the person to move one side of the walker at a time. With a reciprocal walker, there are at least three points of support on the ground at all times. Platform attachments for persons with elbow, wrist, or hand problems are available for both types of walkers. Each attachment adds approximately 2.5 lb to the basic weight of the walker (5 to 7 lb). Wheels are also available, but may be a problem on rough surfaces or in crossing thresholds. If wheels are to be used, the front pair should have autostops built in.

A cane should be held on the side opposite the most painful or weak hip and knee joint. As with the walker, to get maximum benefit from the cane, the elbow should be almost completely straight, allowing the triceps, shoulder, and scapular muscles to absorb the weight. Canes are available with various hand grips. Three- and four-prong canes, designed to improve balance, can be heavy and hazardous if not properly placed down. The bolts and rubber tips on all walking devices should periodically be tightened and checked for wear.

Inability to climb stairs occurred in 75 percent of the homebound patients studied. Traditional methods taught for ascending and descending stairs may not be accepted by patients who have developed their own patterns. Grabbing the railing with two hands, going backwards, placing one hand on the stop, or riding down the steps on the buttocks are examples of methods used by patients. These methods are difficult to change and should not be changed as long as they are safe.

Falls

Falls are epidemic in the elderly.[11,12] A fractured hip may lead to a downward spiral ending in institutionalization, even death. An unexplained fall is a red flag for a medical evaluation to look for treatable causes, eg, visual problems, cervical spondylosis, flexion contractures, unbalanced stance, parkinsonism, nocturia, excess sedative-hypnotic use, postural hypotension, and arrhythmia.

A home assessment for safety hazards can be instructive (Figure 1). In a home evaluation, one should walk through the home with the patient to check the lighting and to look for hazardous surfaces, eg, loose rugs, telephone cords, or heavily waxed or wet floors. Scatter rugs should be removed, secured by tape, or nailed to the floor. Telephone cords should be placed behind heavy furniture or rugs; if possible, another telephone jack should be installed.

Improving lighting is the single most important maneuver to reduce falls and home accidents. An older person requires at least twice as much light as does a 30-year-old person (Table 3). Lighting may be inadequate at the point of entry into an area. In many older apartments the light switch is in the center of the room or on a table. Such inaccessibility can be solved by providing pull-cords nearer the entrance or by having automatic light timers. Dimly lit hallways, pantries, or bathrooms can be improved by keeping a light on at all times. If the dwelling is not owned by the patient, it is necessary to obtain written approval for any structural changes such as relocating electrical switches or providing ramps and rails.

Elderly patients who have had recent cataract surgery are especially prone to falls. Using new glasses changes the perceptions of the environment and makes ambulating precarious. Eye changes can also result in a greater sensitivity to glare and to difficulties with color perception. Glare can be lessened by avoiding highly waxed floors, plastic covers, and shiny surfaces and by shielding windows with curtains or blinds. Edging steps, door jambs, and furniture points with contact tape can alert a person to his surroundings.[13-15]

Visual problems are a critical factor in loss of independent living. Between 75 percent and 80 percent of individuals aged over 65 years currently classified as legally blind could be helped to perform daily living function by low-vision or vision-rehabilitation services.[16] After years of hearing impairment, many people who are fitted with hearing aids do not use them. Although sounds are amplified, the ability to make sense of these sounds requires a new concentration. Early intervention for both visual and auditory problems is essential.

Footwear should be examined. Most homebound patients prefer to wear slippers. This pref-

Determine whether patient can perform the following functions:

	Yes	No
Lock and unlock the door	—	—
Reach light switches (should be at room entrances)	—	—
Call for help (eg, telephone and numbers accessible)	—	—
Handle medication (read label, open bottle)	—	—
Safely transfer from bed, toilet, tub, chair	—	—
Use assistive devices	—	—
Manage toileting at night	—	—

	Attention needed	Work completed
Check for overloaded electric outlets	—	—
Contrast-tape edges of steps	—	—
Cover exposed pipes, radiators, and cords	—	—
Provide skid strips for tub	—	—
Provide adequate illumination	—	—
Remove or repair loose or waxed flooring	—	—
Remove or repair frayed or worn carpets	—	—
Remove scatter rugs	—	—
Remove hanging, pointed, or broken furniture	—	—
Remove wheels from furniture	—	—
Replace worn walker or cane tips	—	—
Secure railings and grab bars	—	—
Consider smoke alarm	—	—

Figure 1. Home assessment for safety

erence should not automatically be discouraged unless the slippers have poor traction or do not stay on the feet. Crepe soles offer good traction, but they may be dangerous for the person with a festinating gait or a gait in which the feet are not picked up. Patients with hip or knee disease frequently have difficulty dressing the lower extremities, for example, putting on and taking off socks and shoes and tying laces. Assistive devices such as long-handled shoe horns or elastic shoe laces can be helpful.

Bathing

A bath, a simple pleasure for many, can be a chore or a threat for an elderly person. Some have not taken a tub bath in years, feeling safer with a sponge or bed bath. A shower seat and a spray hose may facilitate bathing. Seats are available in varying heights with or without backs. In some cases a sturdy kitchen chair may suffice. No matter what the method, a rail and a nonskid mat are essential. Soap dishes will not do for support!

Table 3. Illumination Recommendations for Close Tasks (Watts)

Age (yr)	Watts
30	120
40	145
50	180
60	230
70	300
80	415

Source: Verner C, Davidson C: Physiological Factors in Adult Learning and Instruction. Tallahassee, Fla, Research Information Processing Center, 1978

Rails can be attached either to the wall (professionally) or to the side of the tub. Rails are also available for claw-footed tubs.

Dressing

Many severely limited homebound patients never dress completely, preferring for convenience to stay in a housecoat or pajamas. The psychological benefits of dressing each day should not be overlooked. Whenever possible, the physician should encourage dressing to provide exercise and to promote a sense of independence and purpose.

Conclusions

The home is the best environment for learning about the physical, functional, social, and emotional needs of the patient, and for making a sensible care plan with the patient and family. A home visit should always be considered if the patient functions poorly in the office or clinic. If the primary provider is unable to make a home visit, it can be done by a therapist or nurse from the Visiting Nurse Association. Caring for homebound elderly requires strong family and community supports, and it is important to include these caregivers in the overall plan.

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