

informal care of some kind before the patient's fracture, compared with 82 percent in the Maryland study. At 6 weeks post-fracture, 92 percent of the family caregivers reported providing informal care of some kind. Once the findings of this study are fully analyzed, they will provide better information than is currently available about the amount and types of informal care provided for hip fracture patients.

Given the limited available information about changes in the amount and types of informal care provided for an individual following a hip fracture, OTA decided not to attempt to estimate the indirect costs of informal care for hip fracture patients. As noted above, the only completed study of informal caregiving for hip fracture patients found that the proportion of patients receiving informal care and the hours of care increased in the post-fracture period, but the increases were not statistically significant. There were significant changes from pre- to post-fracture in the types of care provided, and it might be possible to attribute costs to some types of care and not others in a way that would result in a significant change in costs from pre- to post-fracture; to OTA's knowledge, however, there are no generally accepted criteria for making such an attribution of costs. Thus despite the important role that families and friends play in caring for hip fracture patients, OTA's estimate of expenditures for post-hospital services for hip fracture patients does not include an amount for the indirect costs of informal care.

■ OTA's Estimate of Total Per Patient Expenditures for Post-Hospital and Other Outpatient Services

Table 21 summarizes OTA's estimate of 1990 per patient expenditures for post-hospital and other outpatient services for hip fracture patients age 50 and over. It is interesting to note that the total amount for these services exceeds the total per patient expenditures for in-hospital services for hip fracture patients age 65 and over (see table 7), thus

TABLE 21: OTA's Estimate of Expenditures for Post-Hospital and Other Outpatient Services for Hip Fracture Patients Age 50 and Over, 1990

Post-hospital services	Estimated per patient expenditure
Nursing home care	\$7,054
Post-hospital care in a rehabilitation facility or other short-stay hospital	742
Readmission to a short-stay hospital	440
Home health care	453
Nonmedical home care	329
Physician visits	550
Outpatient physical therapy	—
Emergency room and ambulance services	284
Total	9,852

SOURCE: Office of Technology Assessment, 1993

reflecting the importance of post-hospital services in determining overall expenditures for the care of these patients.

LONG-TERM FUNCTIONAL IMPAIRMENT FOLLOWING A HIP FRACTURE

Most people who have a hip fracture do not recover their pre-fracture level of functioning. Different studies have used different criteria to measure functional capacity, including ability to walk independently; ability to perform activities of daily living (ADLs), such as bathing, dressing, transferring, and toileting; and ability to perform instrumental activities of daily living (IADLs), such as shopping, doing housework, and getting to places out of walking distance. Using various combinations of these criteria, four studies have found that only about one-third of all elderly hip fracture patients regain their pre-fracture level of functioning (5,20,50,87). The previously cited study of 536 hip fracture patients treated in seven Maryland hospitals found that more than 60 percent of the patients regained their ability to walk indepen-

dently and almost half regained their ability to perform ADLs by six months post-fracture, but less than one-third regained their ability to perform IADLs (80). At one year post-fracture, more than 40 percent of the patients still could not walk unaided; 60 percent could not perform all ADLs independent y, and more than 80 percent could not perform all IADLs independently.

Focusing on specific functional abilities, Martotoli et al. (82) found that only 8 percent of 120 hip fracture patients treated in two New Haven hospitals from 1982 to 1988 were able to climb stairs six months after their fracture, and only 15 percent were able to walk across a room without assistance, although 74 percent were able to do so with a cane or walker. Ability to transfer independently from bed to chair decreased from 90 percent before a hip fracture to 32 percent after the fracture, although 68 percent of the patients could transfer with the use of a cane or walker at six months post-fracture. Ability to dress independently decreased from 88 percent before a hip fracture to 49 percent after the fracture.³⁰

Most recovery of functional abilities following a hip fracture occurs by six months post-fracture (50,80). The Maryland study found that in the period from 6 to 12 months post-fracture, about 10 percent of patients improved in their functional abilities, but an equal proportion lost functional abilities (80).

Factors that have been found to be associated with failure to regain pre-fracture level of functioning in some studies are older age (5,50,80,87), female gender (5,80), race (30), poorer pre-fracture physical condition and functioning (5,30,50, 82,87), impaired mental status (20,80,82,87), depression (80,87), type of fracture (50,80), operative and post-operative complications (50), post-operative delirium without dementia (80),

longer hospital stay (80), less arm strength (20), and smaller size of the patient's social network (20,80). On the other hand, many of these factors have not been found to be associated with failure to regain pre-fracture level of functioning in other studies.

Compared with older people who have not had a hip fracture, hip fracture patients are more functionally impaired, at least at six months and one year post-fracture. Studies of nationally representative samples of older people indicate that 19 percent of all people age 65 and over have difficulty walking (129), and 19 percent are unable to perform at least one ADL or IADL independently (77, 125). The proportion of older people who are functionally impaired increases with age, and older females are more likely than older males to be functionally impaired. The 1984 Supplement on Aging to the National Health Interview Survey found that the proportion of older females unable to walk independently increased from 12 percent of those age 65 to 69 to 32 percent of those age 85 and over (129). The 1987 National Medical Expenditure Survey found that the proportion of older females unable to perform at least one ADL or IADL independently increased from 11 percent of those age 65 to 69 to 60 percent of those age 85 and over (125).

The results of two longitudinal studies of changes in functional abilities in older people illustrate clearly the severe impact of a hip fracture. One study of change in functional abilities over a six-year period among 356 older people in California found that a hip fracture led to significantly greater loss of functional abilities than any of the other acute medical conditions measured, including heart attack, stroke, and cancer (54). Another study of change in mobility over a six-year period among 7,000 older people in three

³⁰Many studies of post-fracture functional capacity conducted in Europe show that a larger proportion of hip fracture patients regain their pre-fracture level of functioning (see, for example, Ceder et al. (11), Jensen and Bagger (47), Jensen et al. (49), Kreutzfeldt et al. (65), Thomas and Stevens (11 5)). These studies use much broader criteria to measure recovery of functional capacity, e.g., whether a patient returns home after hospitalization, whether the patient receives any home care services, or a global clinical judgment about the patient's functional capacity. By these broader criteria, the studies cited in the text above also would have found that a larger proportion of patients regain their pre-fracture level of functioning.