Occupational Therapist Home Evaluations: Inequalities, But Doing the Best We Can?

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KEY WORDS
• health insurance
• home modifications
• reimbursement

OBJECTIVE. The purpose of this study was (a) to describe the occupational therapy recommendations provided to patients discharged to inner city homes, and (b) to examine the relationship between patient health insurance and the number and type of occupational therapist recommendations for equipment and home modifications.

METHOD. An archival review was conducted of all referrals to the home evaluation program (n = 755) at a large urban rehabilitation hospital between January 1, 1994, and December 31, 1998. Additional patient demographic data and Functional Independence Measure (FIM) data were obtained in electronic form from the hospital information database.

RESULTS. Analysis of results showed that while the pattern of equipment and modification recommendations varied little, publicly insured patients received fewer home modification recommendations compared to privately insured patients (t = 3.7; p < .0005), and were discharged from rehabilitation with significantly lower functional independence (MANOVA F = 3.9; p = .05).

CONCLUSION. Results alert occupational therapists to the relationship between health insurance and treatment recommendations and point to patient advocacy and health policy as potential pathways to desired social change.


Occupational therapists assume a critical role in the lives of patients who return home after rehabilitation (Christenson, 1990). Perhaps more than any other professional on the rehabilitation team, occupational therapists are responsible for determining when a patient’s level of self-care, mobility, and related functional abilities have reached a level sufficient to be considered safe for discharge home (Rogers, 1989). Patient discharge planning is complicated by variations in the type and severity of patient injuries, variations in patients’ recoveries and adaptations to disability, and, just as importantly, by variations in the environments to which patients are returning. Thus, careful assessment of the abilities of each person within his or her home itself is critical to identify barriers that are amenable to change in preparation for a successful return home.

In practical terms, the goal of an occupational therapy home evaluation is to identify what changes to the environment can be made so that everyday activities within and around the home can be as safe and easy as possible (Baker, 1999; Clemson, Roland, & Cumming, 1997; Rogers, 1989; Tideiksaar, 1996). The overall aim of the evaluation and consequent recommendations is to provide an
“enabling environment”—a physical context and opportunity for the occupational goals of persons with disabilities to be attained (Law et al., 1996).

From a public health perspective, the occupational therapy home evaluation may bring the added benefit of preventing secondary injuries. This is a meaningful benefit because unintentional injuries in the home are responsible for significant morbidity and mortality (Josephson, Fabacher, & Rubenstein, 1991; Lee, Ross, & Tracy, 2001). Falls, for example, are the second leading cause of accidental death in the United States after motor vehicle accidents, and for people 65 years and older, falls are the leading cause of death (Hoyert, Kochanek, & Murphy, 1999). Furthermore, one of every three adults age 65 years and older falls each year (Northridge, Nevitt, Kelsey, & Link, 1995; Tinetti, Speechley, & Ginter, 1988), and 60% of fatal falls in this age group happen at home (Sorock, 1988).

Another potentially serious hazard in the home is fire, which ranks as the 7th leading cause of unintentional death in the U.S. Residential fires in 1997 accounted for 3,360 deaths and claimed an estimated $4.6 billion in residential property damage (Hoyert et al., 1999). Karter (1997) states that the U.S. currently has the highest overall fire death rate of all industrialized countries, and residential fires are the most important cause of overall fire-related mortality. For older adults and patients returning home with physical and cognitive impairments, these hazards assume heightened importance (Gill, Robison, Williams, & Tinetti, 1999; Hartke, Prohashka, & Turner, 1998).

Most research focused on home hazards and environmental modifications has been conducted with older adults since they are thought to be one of the most “at risk” groups with respect to injuries in the home (Carter, Campbell, Sanson-Fisher, Redman, & Gillespie, 1997; Gill, Williams, Robison, & Tinetti, 1999). Fortunately, there is a growing body of research to indicate that recommendations for assistive devices and modifications to the physical structure and layout of the house can lessen the risk of injuries, particularly falls. For example, Cumming et al. in Australia (1999) showed that removal of throw rugs and electrical cords and advice about installation of grab bars and nonskid bathmats were significantly related to lower numbers of falls in the intervention group. In other randomized controlled studies examining occupational therapy interventions, researchers have demonstrated that hospital readmission rates can be reduced and personal independence levels increased when environmental hazards and home safety issues are addressed (Close et al., 1999; Mann, Ottenbacher, Fraas, Tomita, & Granger, 1999; Walker, Gladman, Lincoln, Siemonsma, & Whitely, 1999). Even simple modifications such as installation of grab bars (Gitlin, Swenson Miller, & Boyce, 1999) and removal of clutter and use of memory aids can bring dramatic improvements to the daily lives of older adults and their caregivers (Gitlin, Corcoran, Winter, Boyce, & Hauck, 2001).

Despite increasing knowledge about the role of home modifications to improve safety and independence, we know relatively little about the situation of lower-income individuals in urban neighborhoods and the factors that are related to their ability to benefit from home modification recommendations. Yet it is known that the condition of inner city homes is substandard in comparison with suburban homes (American Housing Survey, 1999). The American Housing Survey indicates that inner city residents are less likely to own their own homes, and often face additional restrictions imposed by landlords unwilling to allow modifications to rental property. In related epidemiological research, Waite and Hughes (1999) found that the social complexity of intergenerational households, like those found in this study, also present stresses and challenges to senior members with functional limitations. They found “a definite pattern of poorer functioning among respondents who are arguably in the most demanding and least supportive household environments” (p. S143). Patients who live in the inner city are also more likely to be uninsured or publicly insured. In their comprehensive review of 279,237 admissions to 100 U.S. hospitals in 1993 and 1994, Bradbury, Golec, and Steen (2001) showed that the uninsured and publicly insured have shorter lengths of stay in hospital and are discharged from the hospital sooner than privately insured patients, even though they are sicker overall. Since research demonstrates that the amount of occupational and physical therapy received by rehabilitation patients can have a significant impact on functional outcomes such as personal mobility at discharge (Kirk-Sanchez & Roach, 2001), policies that limit lengths of stay in hospital, including insurance policies, are an important issue. Even after discharge, community outcomes for publicly insured patients are often less than those of privately insured patients (Newman, 1995; Tate, Forchheimer, Daugherty, & Maynard, 1994; Whiteis, 2000). Hence, efforts to identify and address the factors that influence home evaluation recommendations are a priority for those who provide services to patients in inner-city homes.

Study Purpose

The purpose of this study was twofold: to describe the occupational therapy home recommendations provided to a sample of inner city patients and to examine the relationship between patient health insurance and the number and
type of occupational therapist home recommendations given to these patients. We hypothesized that the occupational therapy recommendations would vary by insurance, specifically, that patients with public health insurance (Medicare and Medicaid) would receive fewer recommendations than patients with private health insurance. We also hypothesized that therapist recommendations would not vary with patient age or gender.

Method

Study Design

Study results are based upon a secondary analysis of 5 years of clinical data (January 1, 1994, to December 31, 1998) at a 94-bed urban rehabilitation hospital. The data were originally collected for internal program evaluation and national reporting purposes. The data analyzed were of two kinds: (1) The original reports of all patients who received a home evaluation during the study period (n = 761), and (2) each patient’s Functional Independence Measure (FIM) (Hamilton, Granger, Sherwin, Zielezny, & Tashman, 1987) data and demographic data collected during hospitalization. Prior to review of the data, the study was approved by the Behavioral Investigation Committee/Institutional Review Board at the authors’ institution.

Sample Characteristics

The majority of the patients in the study (n = 755) had a primary diagnosis of cerebral vascular accident (CVA) (n = 275) and spinal cord injury (SCI) (n = 218). The remainder had a primary diagnosis of traumatic brain injury (TBI) (n = 69) or were diagnosed with an orthopedic (n = 139) or other neurological condition (n = 54). The mean age of the patients in the study was 54 years, although ages ranged from 15–91 years. Overall, there were slightly more men (51.5%) in the sample than women (48.5%). Women were more frequently represented in the CVA, orthopedic, and other neurological categories; higher numbers of men were in the SCI and TBI categories. The majority of the rehabilitation patients were African American (76.7%). A substantial number of the patients were covered by Medicare (39.8%) and Medicaid (23.1%) health insurance alone, reflecting the inner-city location of the hospital and demographic profile of the population served. More details are provided in Table 1.

Measures and Procedures

Home evaluation data: The principal data in this study were the occupational therapist home evaluation reports. Each report was typically 2–3 pages long, and focused on personal mobility and transfer performance, assistive device

Table 1. Patient Characteristics and Therapist Recommendations by Patient Insurance Type

<table>
<thead>
<tr>
<th></th>
<th>Medicare</th>
<th>Medicaid</th>
<th>Blue Cross/Blue Shield</th>
<th>Health Maintenance Organization</th>
<th>Catastrophic*</th>
<th>Commercial</th>
<th>Total**</th>
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<tr>
<td>Number</td>
<td>303</td>
<td>176</td>
<td>126</td>
<td>63</td>
<td>62</td>
<td>25</td>
<td>755</td>
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<td>Age (mean, in years)</td>
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<td>40.1</td>
<td>47.0</td>
<td>43.1</td>
<td>46.2</td>
<td>41.6</td>
<td>54.2</td>
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<tr>
<td>Male</td>
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<td>112</td>
<td>64</td>
<td>27</td>
<td>40</td>
<td>14</td>
<td>366</td>
</tr>
<tr>
<td>Female</td>
<td>172</td>
<td>64</td>
<td>62</td>
<td>36</td>
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<tr>
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<td>76</td>
<td>43</td>
<td>46</td>
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<td>580</td>
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<tr>
<td>White</td>
<td>55</td>
<td>18</td>
<td>48</td>
<td>18</td>
<td>13</td>
<td>7</td>
<td>159</td>
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<td>Other</td>
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<td>2</td>
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<td>3</td>
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<td>16</td>
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<td>Length of rehab stay(mean, in days)</td>
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<td>31.9</td>
<td>30.0</td>
<td>28.5</td>
<td>30.8</td>
<td>27.6</td>
<td>27.8</td>
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<td>Total FIM at admission (mean score)</td>
<td>63.2</td>
<td>59.7</td>
<td>62.4</td>
<td>64.9</td>
<td>63.8</td>
<td>62.1</td>
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<tr>
<td>Total FIM at discharge (mean score)</td>
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<td>89.2</td>
<td>87.1</td>
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<td>53</td>
<td>39</td>
<td>14</td>
<td>1</td>
<td>8</td>
<td>275</td>
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<td>40</td>
<td>21</td>
<td>19</td>
<td>8</td>
<td>218</td>
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<tr>
<td>Ortho</td>
<td>63</td>
<td>15</td>
<td>22</td>
<td>11</td>
<td>23</td>
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<td>8</td>
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<td>12</td>
<td>11</td>
<td>18</td>
<td>2</td>
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<td>3.4</td>
<td>3.5</td>
<td>3.8</td>
<td>3.4</td>
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<td>Home modifications</td>
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<td>2.5</td>
<td>2.9</td>
<td>2.8</td>
<td>3.6</td>
<td>2.4</td>
<td>2.6</td>
</tr>
</tbody>
</table>

* category combines automobile and workers compensation
** excludes 6 patients who were self-pay
FIM = Functional Independence Measure
CVA = Cerebral Vascular Accident
SCI = Spinal Cord Injury
TBI = Traumatic Brain Injury
Ortho = Orthopedic
use, and physical layout of the home. Measurements and sketches of doorways, stairs, bathroom configurations, and various other environmental considerations were sometimes included in the reports, as were details about the patient’s ability to move throughout the house, especially how each would exit the home in an emergency. Each report concluded with a list of recommendations for equipment and home modifications based on functional performance deficits observed in the home environment, a copy of which was left with the family at the conclusion of the visit.

The home evaluation program was staffed by one full-time baccalaureate-trained occupational therapist who held the position throughout the 5-year study period. In January 1994, the point of earliest data, this therapist had 11 years of clinical experience. With the exception of a 3-month leave in 1994 and regular vacation coverage, this same therapist conducted 75% of all the study evaluations.

The criteria and procedures for referring patients to the home evaluation program remain unchanged since inception. First, only patients returning home are eligible for a home evaluation; those discharged to institutional settings are not eligible. Second, patients must demonstrate some level of independent personal mobility; those who are entirely dependent are not eligible. Referral to the program is initiated by the patient’s primary inpatient occupational therapist and typically occurs 2 to 4 days prior to patient discharge. The evaluation itself occurs in the residence to which the patient is returning (although in a few study cases, had already returned to) and lasts approximately 45 to 60 minutes. The occupational therapist, a trained assistant, the patient, and a second member of the household, when possible, are present during the visit.

The FIM: FIM data collected during inpatient rehabilitation provided the second source of data. The FIM is an evaluation of function in 18 activities of daily living (ADL): feeding, grooming, bathing, dressing (upper and lower), toileting, bladder and bowel management, locomotion, stair climbing, transfers (bed–chair, toilet, and tub–shower), comprehension, expression, social interaction, problem-solving, and memory. Each item is scored from 1 (completely dependent) to 7 (completely independent) using a standardized, performance-based protocol. A total score of 126 means a patient is entirely independent in all items. The FIM is the most widely used instrument in the inpatient rehabilitation setting in the U.S. and has strong psychometric properties (Cohen & Marino, 2000). Validity has been demonstrated with brain-injured patients and stroke patients (Cook, Smith, & Truman, 1994) and for people ages 80 years and older (Pollak, Rheault, & Stoeckler, 1996). The reliability of the FIM is also well established. Ottenbacher, Hsu, Granger, and Fiedler (1996) reported a median inter-rater reliability for the total FIM of .95 and median test-retest and equivalence reliability values of .95 and .92, respectively. All rehabilitation staff using the FIM to assess patients for this study received ongoing training to ensure optimal standards for FIM administration and scoring.

**Development of the Study Database**

To most efficiently examine the relationships that existed between the occupational therapist recommendations and a variety of patient factors, a database was created. The process occurred in three steps. First, the principal investigator identified the salient variables in the home evaluation reports (patient name, medical record number, age, gender, date of home assessment, bed, tub, and toilet transfer performance, and home recommendations). Under the investigator’s supervision, a trained research assistant (an occupational therapy student) transferred the pertinent data onto individual patient summary sheets. A second trained assistant entered the data from the summary sheets into the statistical database (SPSS, version 10.0).

In the second major step, the identical patient demographic information plus inpatient FIM data at admission and discharge, primary and secondary patient diagnosis, length of rehabilitation stay (in days), and health insurance data, were obtained in electronic format from the hospital information system. In cases where the patient diagnosis lacked specificity (such as “abnormality of gait” or “deconditioning”) or functional significance (such as “hypertension” or “diabetes mellitus”), the secondary diagnosis was used to assist in category assignment. Patients with no primary or secondary diagnostic code in the hospital information system (<5% of subjects) were assigned to the category deemed by the investigators to most closely approximate their functional condition. The health insurance variable consisted of a single “payer code” assigned at admission. The code identified the source of payment for inpatient rehabilitation stay: Medicare, Medicaid, Blue Cross/Blue Shield, health maintenance organization (HMO), commercial, automobile, workman’s compensation, or self-pay.

In the final step, the home evaluation dataset and the hospital dataset were matched on patient medical record number and merged. Only very minor discrepancies in patient data were identified in this process such as minor errors in birth dates and hospital admission and discharge dates. Where discrepancies existed that could not be resolved by the investigators in consultation with the home evaluation specialist, the hospital information system data were accepted as the gold standard. Although a total of 768 occupational therapist home evaluations were originally identified, the merging step identified 3 duplicate and 4 incomplete cases. These were found and eliminated leaving
761 cases. Since very few \((n = 6)\) patients were in the self-pay insurance category, we eliminated these cases, leaving a total of 755 cases for the final analysis.

Data Analysis

Data were analyzed using the SPSS (version 10.0) statistical software package. Descriptive statistics were used to characterize the demographics, diagnostic category, and length of inpatient hospital stay of the sample by health insurance type. To assess functional independence level and improvement of patients during rehabilitation, total mean FIM scores were calculated at admission and discharge. Frequency counts and percentages were used to summarize equipment and modification recommendations across diagnostic categories. The relationships between recommendations for equipment and home modifications and demographic variables (including age and gender) and health insurance type were examined using the \(t\) test and the chi-square tests, as appropriate. Pearson \(r\) correlations were calculated between age, length of stay in rehabilitation, and improvement in patient FIM scores during rehabilitation. Multivariate analysis of variance (MANOVA) was used to assess the relationship between therapist recommendations and health insurance type.

Results

Occupational Therapist Home Recommendations

The first and most general study finding was that recommendations for equipment were only somewhat more common than recommendations for home modifications. With little variability, patients were prescribed on average three pieces of equipment each, with CVA patients tending to have slightly more equipment recommended to them than those in other diagnostic groups. On average, between two and three suggestions for home modifications were made per patient, with TBI patients receiving more home modification recommendations than patients in the other groups. There was no significant difference in number of recommendations (for either equipment or modifications) on the basis of patient age or gender.

In Figure 1, we present the most common recommendations made by the occupational therapist (for equipment and modifications) in the study overall (i.e., recommendations made to at least 10% of all study patients). Equipment recommendations assumed 5 of the first 6 types and included (in order of frequency): commode chair, wheelchairs, and bathtub benches–chairs, handheld showerheads, and standard hospital beds. Each of the first three pieces of equipment (commode chairs, wheelchairs, and tub benches–chairs) was prescribed for more than 50% of patients. In contrast, the two most frequent modification recommendations, to remove throw rugs–clutter and to install a smoke detector, were recommended to patients in 41% and 27% of homes visited, respectively. Exterior ramp and railing recommendations were less common, recommended to 10% to 25% of patients, respectively.

We observed that some types of equipment and home modifications recommendations varied by patient diagnosis whereas others were quite similar across diagnoses. For example, the recommendations for a tub bench–chair (to 55% of all patients), a hospital bed (to 30% of all patients), and to remove shower doors (to 14% of all patients) tended to be made as frequently for patients with CVA, TBI, and SCI as they were for patients with orthopedic conditions and other neurological conditions. In contrast, a commode was much more likely to be recommended to a CVA patient (> 80%) than to any other. Similarly, a handheld shower (54%) and installation of bathtub treads (38%) were much more likely to be recommended to a TBI patient.

Finally, we observed the relative absence of recommendations for grab bars and other small self-care devices to assist in activities of daily living (ADL). These items were recommended to only 9% and 2% of patients, respectively.
Patient Health Insurance Type and Outcomes of Inpatient Rehabilitation

Some of the most interesting study findings emerged during analysis of the occupational therapist home recommendations by patient health insurance. For the entire sample, the mean total FIM score at admission was 62.6, and at discharge it was 87.1, a 25-point gain. This means patients in the study improved, on average, from about a “3” (moderate assistance) or a “4” (minimal assistance) on the FIM tasks to nearly a “5” (supervision or setup) on the 7-point scale. However, patients with public health insurance (Medicare and Medicaid) had lower discharge FIM scores, on average, than patients with private insurance ($t_{[759]} = 3.2; p = 0.002$). This was partly due to the fact that Medicaid patients entered the hospital with lower FIM scores than those with other insurance types, and partly due to the fact that Medicare patients had relatively shorter lengths of stay in inpatient rehabilitation.

Length of inpatient rehabilitation stay was positively correlated with functional improvement during rehabilitation (Pearson $r = 0.278; p < 0.0005$). Patients with Medicaid insurance stayed in rehabilitation 8 days longer than those with Medicare insurance ($t_{[470]} = 6.2; p < 0.0005$). This resulted in slightly higher total FIM discharge scores for Medicaid patients, on average, as compared with Medicare patients (see Table 1). Medicaid patients stayed in rehabilitation, on average, 2 1/2 days longer than patients with private insurance (not statistically significantly longer). However, patients with private insurance had higher FIM scores at admission and consequently higher FIM scores at discharge (see Table 1).

Finally, we observed that older patients had significantly shorter rehabilitation stays (Pearson $r = -0.302; p < 0.0005$) than younger patients, and therefore less improvement on their FIM scores (Pearson $r = -0.189; p < 0.0005$). This was the case for each health insurance type except Medicare. Statistically significant differences in FIM discharge scores for patients with public versus private health insurance remained, even after controlling for injury severity (FIM score at admission) and age (MANOVA $F = 3.9; p = 0.05$).

Thus, we have some evidence to suggest that patients who are older as well as patients with public (versus private) health insurance tend to realize less functional improvement during inpatient rehabilitation.

Patient Health Insurance Type and Occupational Therapist Recommendations

The pattern observed in hospital of publicly insured patients faring less well than privately insured patients (less functional improvement and lower FIM discharge scores) was also identified in some of the home evaluation data. Patients with automobile and workers’ compensation insurance received the greatest number of therapist recommendations (see Table 1). Publicly insured patients received fewer home modification recommendations compared with privately insured patients ($t = 3.7; p < 0.0005$). This was also true when Medicaid and Medicare patients were separately compared to privately insured patients ($t = 2.4, p = 0.016; t = 4.0, p < 0.0005$ respectively). There were no significant public–private health insurance differences in the number of therapist equipment recommendations.

We also examined each of the most common equipment and home modification recommendations by health insurance type (see Figure 2). There were no significant differences here between publicly versus privately insured patients except for the recommendation to install a smoke detector: Patients in the Medicare–Medicaid insurance group were recommended a smoke-detector 10% more often than their privately insured counterparts (Medicare-Medicaid = 31%; private = 21%; $x^2 = 9.2, p = 0.002$). Aware that some equipment and home modifications are typically recommended in combination, for example, a person who is recommended a wheelchair is also recommended a wheelchair ramp, we observed that wheelchair users with Medicare or Medicaid health insurance were less likely to receive the wheelchair ramp recommendation than...
those with private health insurance (Medicare-Medicaid = 23%; private = 36%; \(x^2 = 8.7, p = 0.003\)).

Discussion

In general, the study findings reflect the inner-city population studied: three-quarters of patients were over the age of 50 years, and two-thirds were insured under Medicare and Medicaid programs. With respect to inpatient rehabilitation outcomes, this means that while our sample's mean FIM score improvement (25 points) was virtually identical to the national average (24 points) (Fiedler, Granger, & Russell, 2000), the mean total FIM score for our sample at discharge was lower than the national average, which is calculated on a population of patients who are younger and more likely to be privately insured. The finding that patients in the Medicare and Medicaid insurance groups had significantly lower function at discharge from rehabilitation is mostly explained by the greater injury severity of the Medicaid patients at admission and the older age of the Medicare patients (who had shorter lengths of stay). The remaining differences between publicly and privately insured patients may be due to insurance policies that set the parameters for coverage and days of stay in inpatient rehabilitation or due to a greater number and severity of comorbidities within the publicly insured sample. Previous research has confirmed that both access to care and duration of rehabilitation vary by insurance payer (Angelelli, Wilber, & Myrtle, 2000; Bradbury et al., 2001; Svenson & Spurlock, 2001). Whatever the reasons, the fact that Medicaid and Medicare patients leave inpatient rehabilitation with lower functional ability than their privately insured counterparts indicates that they may be in greater need of equipment and home modifications.

Our analysis of the home evaluation data showed that the occupational therapist home recommendations closely reflect the pattern of recommendations reported in the literature. For example, commodes, wheelchairs, and chairs–benches for the bathtub were the three most common pieces of equipment prescribed. This finding is supported by the literature that suggests the most commonly prescribed equipment is for personal mobility, followed by bathing and toileting equipment (Gitlin, Schemm, Landsberg, & Burgh, 1996; Gitlin et al., 1999; Hastings Kraskowsky & Finlayson, 2001; Sonn, Davegardh, Lindskog, & Steen, 1996). It is also the case that these three specific types of equipment were reimbursable under current Medicare and Medicaid insurance guidelines in Michigan at the time of the study.

The finding that removal of throw rugs, clutter, and furniture that impeded mobility in the home was the most frequent home modification recommendation was not surprising either. Occupational therapy research confirms that removal of trip hazards is a top priority for occupational therapists focused on safety and independence in the home (Anemaet & Moffa-Trotter, 1999; Clemson, Cusick, & Fozzard, 1999; Gitlin et al., 1996). In our study, removal of throw rugs–clutter was recommended in slightly more than 40% of cases. This is very similar to the findings of Cumming et al. (2001) in Australia who reported “removal of mats” was the single most common recommendation in their study of 178 homes at 48%.

Less expected was the relatively high number of homes with a recommendation for a smoke detector, 27% of homes overall, but 30% of Medicare–Medicaid homes. The best explanation for these findings is that there was no functioning smoke detector in these homes at the point of home visit. It may also be the case that patients who reside in inner-city homes are at elevated risk for unintentional injury as a result of the condition of their homes, a hypothesis that is supported by other research (Schwarz, Grisko, Miles, Holmes, & Sutton, 1993).

Our finding of no significant variation across patient diagnosis in the frequency of recommendations for some types of equipment and home modifications, but significant variation for other types is not unexpected. It is quite understandable that the same piece of equipment and the same change to the home can enhance safety and independence in patients with a range of functional difficulties, resulting in little variation by patient diagnosis. On the other hand, the functional limitations imposed by a specific diagnosis may require equipment or home modifications not needed by patients with other diagnoses. Our finding of no significant differences in the numbers of equipment and home modifications recommended on the basis of patient age or gender is in contrast to some limited literature that suggests older patients and females are more likely to be prescribed assistive devices and specialized equipment than younger patients and males (Edwards & Jones, 1998; Sonn et al., 1996).

We note that the infrequent recommendation of smaller ADL equipment items was in fact a reflection of the local circumstances of patients in this study and the structure of the home evaluation program itself. A special program at the rehabilitation hospital maintained a supply of small ADL items that are not reimbursable under Medicare or Medicaid programs. Although many of these items such as long-handled bath brushes, combs and shoehorns, and elastic shoeaces, for example, are inexpensive, they were beyond the financial reach of many patients in our study. The small equipment program was initiated by the therapists at the hospital years earlier in recognition that these
devices would not otherwise be available to their patients.

There were other examples where equipment recommendations were likely driven by the financial means of patients and health insurance reimbursement guidelines (in addition to patient impairment level and physical context of the home). Bathroom grab bars, for example, are not routinely reimbursable under Medicare and Medicaid guidelines, and were rarely recommended in this study. However, patients with private insurance were more likely to be recommended grab bars than patients with public insurance ($x^2 = 23.2; p < .0005)$. Raised toilet seats (not reimbursable) were recommended very infrequently too and instead commode chairs (reimbursable) were the most frequently recommended piece of equipment. Again, we found patients with private insurance were more likely to be recommended raised toilet seats than patients with public insurance ($x^2 = 15.4; p < .0005$). It is likely a common clinical reality that the occupational therapist, aware of the health insurance guidelines and the financial resources of the client, tailors her or his home recommendations with these constraints in mind. Thus, the practitioner’s task in the homes of patients is not merely to provide recommendations to improve or maintain patient safety and independence given the physical context of the home and levels of personal assistance available to the patient within the home, but rather to provide the best practical recommendations given the functional and financial circumstances.

**Study Limitations**

The primary limitations in this study relate to the design of the study (archival review) and the fact that findings primarily reflect the professional practice of one occupational therapist with a particular case-mix of rehabilitation patients. The study offers some evidence that results are not atypical: Rehabilitation improvement demonstrated in this sample, for example, mirrors the national average, and home evaluation recommendations are generally in line with existing research. Since no study to date has reported findings with respect to rates of occupational therapy home recommendations by patient insurance status, additional research will need to be conducted before it is possible to compare these study results with others in this respect.

We also emphasize that this study examined the question of potential inequalities in occupational therapist home recommendations. We do not have data on the actual implementation of the home recommendations or the effect of financial cost on the decision-making process. While the present study sheds light on the question of potential disparities in occupational therapy practice patterns, additional research is needed to answer questions about the impact of patient health insurance type on the implementation of these recommendations that, in turn, are known to contribute to longer term functional outcomes.

**Implications for Occupational Therapy Practitioners**

We are encouraged to report that recommendations for the most common pieces of equipment were as likely to be made for patients with Medicaid and Medicare insurance as they were for patients with private insurance. The most common (and “no cost”) modification recommendation “to remove rugs–clutter” was similarly as likely to be made to patients with Medicaid and Medicare health insurance as to patients with private insurance. Still, the number and kinds of recommendations for equipment and home modifications appeared to be influenced, at least in part, by the practice context—including the patient’s perceived ability to pay for more costly home modifications. As discussed earlier, fewer numbers of recommendations for home modifications were made for patients insured under Medicare and Medicaid. On the one hand, this is hardly surprising.

We are all aware that there are major differences between public and private health care insurance, and public insurance simply does not cover certain items, and when it does, the list of eligible equipment is more limited than many private health insurance plans. More costly home modifications are also less likely to be covered by Medicare and Medicaid than other forms of health insurance, for example, automobile insurance. On the other hand, this study provides some preliminary evidence to suggest that the existing health insurance system entrenches and exacerbates health disparities: since the Medicaid and Medicare patients as a group were older and had lower function at discharge from rehabilitation (as measured by the FIM), and therefore arguably had greater need. Recent research about the course of functional improvement in rehabilitation has shown that persons with lower initial function improve essentially as much as those with higher function, although their rates of improvement are slower and it takes longer to achieve these gains (Bode & Heinemann, 2002). It would seem therefore, that to the extent that rehabilitation stay is influenced by health insurance policies, these policies contribute to diminished functional outcomes for those who cannot pay to extend their course of rehabilitation. In the same way, since research suggests that supplemental health insurance does act as an enabling factor with respect to the use of equipment and home modifications (Mathieson, Kronenfeld, & Keith, 2002), it would seem that to the extent that implementation of occupational therapist home recommendations are influenced by health insurance policies, these policies also contribute to diminished functional outcomes for those who cannot pay.
Conclusion
The results of this study highlight the very real constraints occupational therapists operate under in daily practice and support the findings of similar research reported in the physical therapy literature (Uili & Wood, 1995). Factors such as third-party payer exert a daily influence on a therapist’s ability to provide optimal rehabilitation for his or her patients, because “optimal” is defined within the constraints of “the patient’s ability to pay.” Although there was no evidence in this study to suggest that occupational therapists’ home recommendations for either equipment or home modifications were unjustifiably influenced by patient health insurance type, the fact remains that patients with Medicaid and Medicare insurance were discharged home with lower levels of function and had more limited ability to pay for equipment and modifications. In this way, the results of this study point out how deeply health policies penetrate clinical decision-making on a day-to-day basis and speak to the personal tensions that are experienced by therapists whose professional training has prepared them to address functional challenges at the individual level (Walker, 2000), and not policy challenges at the ideological level (Jongbloed & Wendland, 2002).

Lohman and Brown (1997) address the issue of therapists’ ethical obligations and moral stance in the particular context of managed care and urge clinicians to vigorously represent and advocate for patients—not only in direct service situations, but at policy levels as well. Many occupational therapists who work in inner-city environments already pursue alternative modes of funding to implement home safety recommendations (Pynoos, Tabbarah, Angelelli, & Demiere, 1998). Another strategy is to learn and employ the specific rules and documentation language of insurance companies so that occupational therapy interventions have the best chance of being accepted by payers (Uili & Wood, 1995). These strategies may be useful to address some of the inequalities highlighted in this study, but they can only be effective at the level of the individual. Can more be done? Gorey (1999) states, while the U.S. healthcare system provides some of the best healthcare in the world, its policies and services also effectively fall one in every five Americans. This is most certainly a challenge for all health care professionals, not only occupational therapists.

Acknowledgments
We thank the occupational therapists who originally collected the data for this project, especially Karen Murphy, OTR, the long-time home evaluation specialist at the Rehabilitation Institute of Michigan. We also thank Doug Perrin at the Detroit Medical Center for his assistance with data access. This project was supported in part by an award from the Wayne State University 2001–2002 Research Grant Program.

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