

**Providing Low-Cost Assistive Equipment Through Home Care Services:  
The Massachusetts Assistive Equipment Demonstration**

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April 2000

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## ACKNOWLEDGMENTS

We greatly appreciate the funding and staff support we received from the Robert Wood Johnson Foundation's Home Care Research Initiative. We thank Paul Petrone of Spaulding Rehabilitation Hospital for his input into development of the evaluation instruments as well as his availability to respond to questions by ASAP staff regarding assistive equipment. We appreciate the thoroughness with which staff from the Center for Survey Research carried out the three sets of client interviews: Michael Massagli for developing the instruments, Greg Fitzgerald for managing the data, and Dottie Cerontowski for overseeing the interviews. We appreciate the efforts of all members of the project working group for attending so many meetings that proved critical to maintaining lines of communication and working out implementation issues. Specifically, we wish to thank Teri Checket and Jennifer Peura of WSES, Peg Nysten and Sue Egan of SSES, and Barbara Chandler of EOEA. We also wish to acknowledge the many doctoral students from the Gerontology Institute who helped with data management.

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# **Providing Low-Cost Assistive Equipment Through Home Care Services: The Massachusetts Assistive Equipment Demonstration**

## **EXECUTIVE SUMMARY**

This report describes the Massachusetts Assistive Equipment Demonstration, a collaborative project funded by the Robert Wood Johnson's Home Care Research Initiative and carried out collaboratively by the Gerontology Institute at the University of Massachusetts Boston and the Executive Office of Elder Affairs (EOEA). The purpose of the demonstration was to systematically encourage the use of low-cost assistive equipment among elderly clients through existing case management resources, thereby extending the effectiveness of the Massachusetts home care program by supplementing formal services with expanded use of assistive equipment.

The role that low-technology assistive devices can play in helping older adults maintain independence and autonomy has been gaining interest. Although assistive equipment has been demonstrated to be highly beneficial to older people with self-care limitations, equipment is typically underutilized or used irregularly, and barriers to effective use of equipment are substantial. The Massachusetts Assistive Equipment demonstration was undertaken in an effort to address some of the barriers to greater use of low-cost assistive equipment through the state-funded home care program, using public monies to fund the equipment and case managers to facilitate the introduction of equipment to elders.

The demonstration was carried out through two Aging Services Access Points (ASAPs) with a similar client base. The Executive Office of Elder Affairs provided oversight for implementation of the

program, and the Gerontology Institute conducted research activities aimed at evaluating the impact of the program, which included client interviews conducted by the Center for Survey Research (CSR).

Through the project, case managers received training from occupational therapists on assistive equipment for elders. Case managers then identified potential clients and, as part of their routine reassessment visits, worked with them to choose appropriate assistive equipment, which was purchased with public funds. Equipment was shipped directly to clients, and case managers made follow-up calls to determine clients' difficulties or satisfaction with the devices.

A quasi-experimental pre-test/post-test design was used to evaluate the demonstration. Clients from the experimental ASAP received equipment six months prior to clients from the comparison ASAP, with evaluation data (a combination of client interviews and client records) collected at baseline and six months after the interventions. CSR conducted in-person interviews to assess clients' perceived difficulties performing tasks associated with several daily living activities (meal preparation, dressing, bathing, and expressive) and their experiences with assistive equipment that addressed these tasks.

Thirty-eight case managers received training and distributed equipment through the demonstration to 196 home care clients. Although case managers were encouraged to spend an average of \$150 per client, actual purchases were quite modest; clients received an average of four items, and the average expenditure per client was \$76. Nearly half the distributed items were associated with meal preparation, with others addressing bathing, dressing, and mobility. Client benchmarks were high, with 70% reporting that they used their devices regularly, 60% reporting their devices as "very helpful," and 90% expressing high overall satisfaction.

An impact analysis was conducted that compared the experiences of clients from the experimental and control groups. There were no measurable associations between the types of items distributed and the specific tasks for which clients reported difficulty. Moreover, receiving equipment was not associated with changes in perceived difficulty with functional tasks. This was not surprising, given the modest amount of equipment distributed. Case studies and item analysis, however, provided evidence that the intervention increased functional independence in some areas.

An important outcome of this demonstration was the identification of implementation issues to be addressed if home care programs are to be effective vehicles for disseminating assistive equipment. These issues do not present overwhelming challenges and could be addressed with relatively modest input of additional resources and effort. Case managers need comprehensive, hands-on training on the potential benefits of equipment, identifying appropriate devices, and methods for working with clients on the use of equipment. Time for determining clients' equipment needs should be built into case managers' assessment and reassessment schedules. At the agency level, a well-developed system for ordering, delivering, installing, and monitoring equipment distribution is needed.

This demonstration indicated the potential for expanding state-wide home care services to elders by having case managers, with appropriate training, assess, recommend, and procure low-cost assistive equipment as part of their routine client re-evaluations. Although it was not possible to demonstrate that providing low-cost assistive equipment resulted in measurable improvement in elders' functional independence or ability to carry out daily tasks, client satisfaction benchmarks were high. A number of implementation issues were identified that should be addressed for successful introduction of assistive equipment through the home care program.

## INTRODUCTION

Developing innovative, low-cost ways to help elders remain in the community has become critically important, given demands on publicly funded services for the increasing elderly population. As a consequence, the role that low-technology assistive devices can play in helping older adults maintain independence and autonomy is gaining interest. Typically, assistive equipment is recommended when older adults are undergoing rehabilitation for acute or multiple chronic conditions such as stroke or severe arthritis. Much less common, however, are efforts to systematically introduce the use of assistive equipment to elders outside of medical or rehabilitation centers.

The Massachusetts Assistive Equipment Demonstration was a collaborative project between the Massachusetts Executive Office of Elder Affairs and the Gerontology Institute at the University of Massachusetts Boston. The purpose of the demonstration was to systematically encourage the use of low-cost assistive equipment among elderly clients through existing case management resources. It was expected that, with modest training, case managers could identify clients for whom low-tech devices might be beneficial, identify and order appropriate devices, and support clients in using the devices. It was further anticipated that the use of appropriate equipment would improve elders' ability to manage daily living tasks independently. Thus, the aim of the project was to extend the effectiveness of home care by supplementing formal services with expanded use of low-cost assistive equipment.

## BACKGROUND

Many older people are adversely affected by impairments that reduce their capacity to care for themselves, often requiring substantial efforts of informal caregivers or costly formal services. The adverse affects of some ADL and IADL deficits can be mitigated by assistive equipment. However, simple, low-cost assistive devices are often overlooked as potential resources, with greater attention focused on high-technology equipment addressing the requirements of individuals with severe disabilities and highly specialized needs (Enders, 1986).

Some older people, for example, can benefit from simple equipment to help with food preparation (such as cooking implements with built-up handles, jar openers and rocker knives that require only one hand and minimal strength and dexterity, or household appliances with raised or enlarged letters), dressing (such as gadgets to assist with putting on socks, clothing with Velcro closures, and zipper pulls), bathing (such as bath seats, grab bars, long-handled bath brushes, or hand-held shower units), expressive activities (such as book-holders, magnifiers, or grips for pencils or crochet hooks), or mobility (such as reachers, door-knob grips, walker baskets, and rolling carts).

A number of studies have reported on the use of assistive equipment among older adults. Many of these studies have surveyed elders who have undergone rehabilitation for acute or multiple chronic

conditions, such as stroke or severe arthritis (Gitlin, Luborsky, & Schemm, 1998; Mann, Huren, & Tomita, 1995; Mann, Huren, Tomita, & Charvat, 1995). Studies based on representative samples of community-residing older adults have reported an increase in the use of assistive devices, mostly to address mobility or hearing limitations (LaPlante, 1992; Hartke, Prohaska, & Furner, 1998; Manton, Corder, & Stallard, 1993; Zimmer & Chappell, 1994).

Although assistive equipment can be highly beneficial to older people with self-care limitations, equipment is typically underutilized (George, Binns, Clayden, & Mulley, 1988) or used irregularly (Gitlin, Levine, & Geiger, 1993), and barriers to effective use of equipment are substantial. Reasons for non-use of items have been reported by elders discharged from hospital rehabilitation units and their therapists (Gitlin, 1993; Luborsky, 1993). These reasons included socio-cultural factors such as a preference for relying on personal assistance, feelings of embarrassment or stigma associated with using assistive equipment, and the denial of disability or the need for equipment. Other reported barriers to greater use of assistive devices are a lack of knowledge about how to use the device; a poor fit between the device and the elder's individual need or home environment; the device being lost or forgotten, failure or malfunction of the device; or finding the item too cumbersome, painful, or time-consuming to use (Gitlin, Luborsky, & Schemm, 1998; Gitlin, 1995). The most commonly reported reasons for not having or trying a device include lack of information (regarding the existence of devices or how to obtain them), cost, and believing that the disability is not serious enough to address ("Challenges.....," 1999).

Based on a survey conducted by the American Society on Aging (1997), State Units on Aging (SUAs) have been only moderately involved with or committed to addressing the assistive technology needs of older clients, with Area Agencies on Aging (AAAs) only slightly more so. As compared to the nation as a whole, Massachusetts ranked low in its involvement with and commitment to assistive technology and home modification. Prior to this demonstration, EOEA conducted a survey of elders and individuals with disabilities (EOEA, 1998). Findings from this survey reinforced the potential as well as the challenges associated with increasing the use of assistive technology devices to community-residing frail elders who were experiencing substantial declines in daily functioning. Thus, Massachusetts was a state that stood to benefit from an innovative program involving commitment of publicly-funded resources to promote increased use of low-cost assistive technology among elders served through the state home care program.

The Massachusetts state-funded home care program is administered through 27 regional agencies called "Aging Services Access Points" (ASAPs), until recently known as "home care corporations." Because of cost-demand pressures, program eligibility is restricted to older people whose self-care deficits are substantial and whose financial resources are very modest. The Massachusetts home care program currently arranges a variety of services for its clients. Most clients receive homemaker services. Many also receive home-delivered meals. To the extent that resources permit, case managers may also authorize other services including personal care, adult day health, and transportation. While regulations permit the use of service funds for equipment, the state-wide program has not explicitly promoted assistive equipment that might enable clients to achieve greater

independence. Thus, the state home care program viewed this project as attractive because of its potential for increasing clients' self-sufficiency in daily living tasks at minimal additional cost.

The role of ASAP case managers is to assess client needs and authorize services, which are then provided through independent contractors. Clients are reassessed every six months, although case managers either do home visits or check on clients by telephone at least once in the interim. Case managers typically carry case loads of 90 to 100 clients. There is often high turn-over for this entry-level job that requires a bachelor's degree.

The Massachusetts Assistive Equipment demonstration was undertaken in an effort to address some of the barriers to greater use of low-cost assistive equipment through the state-funded home care program, using public monies to fund the equipment and case managers to facilitate the introduction of equipment to elders. The premise underlying the demonstration was that case managers have already established relationships with their clients and are knowledgeable about their clients' needs. It was hypothesized that case managers could promote the use of assistive equipment among elders in the home care program by increasing client knowledge about equipment options, encouraging clients to try out equipment, assisting clients with acquisition and installation of equipment, training clients in the use of equipment, and following up with clients regarding additional equipment needs. Moreover, it was expected that case managers could incorporate equipment-related activities as part of their routine client reassessment visits with the investment of little additional time.

This research and demonstration project, funded by the Robert Wood Johnson's Home Care Research Initiative, was conducted collaboratively by the University of Massachusetts Boston and the Massachusetts Executive Office of Elder Affairs (EOEA) through two Massachusetts ASAPs. The major purpose of this project was to determine whether the effectiveness of formal home care services could be extended through the systematic introduction of low-cost assistive equipment to elderly clients. The specific objectives of the project were to determine (1) if publicly funded home care providers could increase the use of low-cost assistive equipment among their clients with minimal extra case management time; (2) if appropriate use of low-cost assistive equipment would have beneficial consequences for elders; and (3) if Massachusetts should systematically encourage greater use of low-cost assistive equipment on a regular basis within state-funded home care programs for the elderly.

Although this demonstration project was undertaken with a great deal of forethought and enthusiasm, the actual experiences challenged a number of the premises underlying the project. These experiences also challenged the efforts to evaluate the project's impact. This paper sets out to describe the assistive equipment project within the context of the Massachusetts home care system and to describe some of the difficulties encountered in implementing such a program. It provides a detailed description of the research elements and associated challenges (measurement development, sampling, data collection, coding, and analysis). Evaluation findings, both quantitative and qualitative, are presented. Finally, complexities that emerged from simultaneously introducing and evaluating an innovative intervention are discussed.

## RESEARCH AND DEMONSTRATION DESIGN

The assistive equipment demonstration project was conducted through two ASAPs with a similar client base, West Suburban Elder Services (WSES) and South Shore Elder Services (SSES). The Executive Office of Elder Affairs (EOEA) provided oversight for implementation of the program. The Gerontology Institute conducted research activities aimed at evaluating the impact of the program. Key personnel from the Gerontology Institute, EOEA, and the participating ASAPs (a site coordinator and a case manager from each) met regularly to discuss and work out policy and implementation issues as they arose during the demonstration.

### Implementation plan

The expectation for the intervention was that case managers would receive training on the potential benefits and positive indicators of low-cost assistive equipment for elders. Case managers would then identify potential clients who would be solicited for the research/evaluation component. After further training from occupational therapists on assessing for and selecting appropriate devices, case managers would work with their designated clients to help them choose assistive equipment, which would be purchased with public funds. It was expected that case managers would include assessment for equipment within their routine reassessment visits and would follow-up with clients (by telephone or subsequent visits) on use of the items they received and further equipment requests (demonstration or additional items).

### Design of the evaluation component

The following quasi-experimental pre-test/post-test design was used to evaluate the demonstration.

#### **Quasi Experimental Design**

Site 1	O	X	O		
Site 2	O		O	X	O

The design called for identifying approximately 150 clients from each ASAP who had the potential for benefitting from assistive devices because they were experiencing difficulty completing daily living tasks, were motivated to remain independent, and were alert and able to respond to interview questions. The focus of the demonstration project was clients who were experiencing gradual declines in their ability to perform daily living tasks. In addition, clients with significant cognitive impairments or memory loss were not targeted for the demonstration because it was expected that they would be unable to provide meaningful interview data. Although it was recognized that assistive equipment can also be helpful to client caregivers, this demonstration focused on providing equipment that could be directly helpful to the clients themselves.

The design called for clients from WSES, the experimental site, to receive equipment six months prior to clients from SSES, the comparison site, to allow an impact assessment. Data were collected from all participants at baseline (T1) and, again, six months after the experimental group had received equipment (T2), with final follow-up data collected for the control group six months after they received equipment (T3). This design provided the opportunity for comparisons between clients who had received equipment systematically from the project and those who had not.

### Measurements

There were three sources of data used in the evaluation: information extracted from client records, equipment tracking data collected by the ASAPs, and client interviews conducted by the Center for Survey Research (CSR) at the University of Massachusetts at Boston. Each of these is described below.

Client background information. Client background information was extracted from client records. To minimize data collection demands on the ASAPs, a brief form was developed to record client age, gender, ethnicity, marital status, sensory limitations, and functional impairment level (FIL) ratings. The form also documented housing status, household members, social participation, and adequacy of social supports. Photocopies of the most recent ADL and IADL ratings and client service plans, which outline formal and informal services, were attached.

Equipment tracking forms. Devices distributed through the intervention were recorded on a form that indicated the specific device, cost, date of delivery, and activity domain for which items were primarily to be used. At intervals of 2 days, 2 weeks, and 3 months after equipment was delivered, case managers were requested to contact their clients to assess the extent to which they were satisfied with and using the devices, as well as to identify problems, needs for demonstration, or additional equipment needs.

Client interview protocols. Client interview protocols were developed through a collaborative process. Researchers at the Gerontology Institute developed the initial questionnaire, with feedback from ASAP case managers and occupational therapists from Spaulding Rehabilitation Hospital. As a next step, the research team from the Gerontology Institute and researchers from the Center for Survey Research (CSR) convened a focus group comprising elders from the Newton Senior Center to identify key daily living issues of concern to elders and assistive devices with which elders are familiar. The resultant interview protocol, which reflected insights from elders, case managers, and occupational therapists, was pilot-tested in the community and revised in response to respondents' reactions. Follow-up interview protocols repeated the original questions but included provisions for assessing clients' experiences with items received through the project and services associated with the demonstration.

The interview protocol was divided into six sections. The first section addressed clients' assessments of their social opportunities and overall health. The remainder of the protocol focused on each of five domains of daily living for which assistive equipment might be appropriate: meal preparation, bathing, dressing, medication management, and expressive activities. The researchers recognized that these domains did not represent an exhaustive list of activities associated with the capacity for independence and avoiding nursing home placement. However, the researchers believed it was important to organize the questions into a manageable schemata, and there was consensus among key stakeholders that the five domains were the most important areas to address. Researchers also recognized that ability to perform activities within each of these activity domains could be affected by different disabilities (loss of vision, hearing, mobility, strength, etc.). Thus, questions reflecting these different functional areas were included within each activity section.

Identifying outcome measures that would be sensitive to the effects of such an individualized and subtle intervention was challenging. Typically, evaluation research relies on indicators distantly associated with the intervention, such as hospitalizations, nursing home placements, or medical costs. Self-report data are typically limited to client satisfaction ratings. For this study, the researchers attempted to develop more sensitive measures that reflected clients' perceptions of their ability to complete daily tasks as well as their assessment of the quality of their daily circumstances for each of the activity domains examined. The measures are described below.

Use of assistive devices. Equipment forms were used to track items distributed through the project. The researchers were aware, however, that the extent and adequacy of equipment distribution would also be a reflection of clients' experiences with equipment prior to the intervention. Some clients possessed and used assistive devices acquired through the ASAPs (in the case of bathing equipment), from rehabilitation professionals, or from other sources. In addition, since the researchers anticipated that the concept of assistive equipment would be unfamiliar to many of the participants, language that would be used to assess the acquisition and use of devices through the project was introduced as part of the baseline interview. Consequently, for each of the five domains, clients were presented a list of four to six items, which were thought to be familiar to many elders and addressed anticipated task difficulties.

For example, in the area of meal preparation, questions asked about a microwave oven, easy-grip jar opener, cooking utensils with easy-grip handles, no-slip cutting board, and any other similar equipment or gadgets clients used to make food preparation easier. Participants were asked if they had and how often they used each item ("a lot, sometimes, almost never"). For each of the five activity domains, summary variables were constructed to reflect the number of devices participants acknowledged possessing and the extent to which they used their devices.

As part of the follow-up interviews, provisions were made in the interview protocol to question participants about items they had received through the demonstration (as reported on the equipment tracking forms). Specific items received by clients were individually added to each interview protocol in the most appropriate section (e.g., zipper pull inserted into questions on the dressing domain).

Questions asked participants to confirm whether they had received these items and the extent to which they used them. (Thus, follow-up summary variables reflected both initial and newly acquired devices.)

Additional questions addressing clients' use of equipment were included in both baseline and follow-up interviews. Each domain also included questions rating the helpfulness of items and reasons for not using items more frequently. Questions were also included to assess clients' overall experience with the intervention.

Perceived task difficulty. Case managers' recorded assessments of clients' ADL and IADL ratings were one indicator of ability to complete daily living tasks. ADL and IADL ratings are based on clients' ability to manage tasks (with devices if they use them). In principle, the introduction of devices should reduce ADL or IADL deficits in some instances. The researchers believed, however, that participants' personal perceptions regarding the difficulty or ease of performing specific activities (with or without assistive devices) might provide more sensitive indicators of the effectiveness of the intervention and might be more clearly tied to distributed equipment items. For example, clients' assessments of how difficult it was for them to wash their feet and legs (as opposed to general bathing capacity) or to open jars, bottles, or cans, (as opposed to general meal preparation).

Thus, a series of questions for each activity domain was developed to measure clients' perceptions of task difficulty for different dimensions. (See Appendix A for a list of problem areas by activity domain.) Questions used a two-part response system. Clients were first asked if they were able to do the task (yes/no). If able, a follow-up question asked the level of difficulty the task presented. [For example: "Are you able to open jars, bottles, or cans?" (able/unable), followed by (if able), "How much of a problem do you have doing this...would you say a big problem, a little problem, or no problem at all?"] Thus, for each task, potential level of difficulty was measured on a 4-point scale, ranging from 1 ("no problem") to 4 ("unable"). Standardized summary scales provided measures of overall task difficulty with meal preparation, bathing, dressing, medication management, and expressive activities. Except for medication management, internal consistency (based on Cronbach's alpha scores) was acceptable to high, ranging from .60 for medication tasks to .82 for dressing and bathing tasks. (See Appendix A for a list of question items and alpha reliability scale scores for the Perceived Difficulty Scales.) A global question was also asked for each task area: for example, "All things considered, how easy is it for you to get dressed these days? Would you say very easy, easy, difficult, or very difficult?"

## PARTICIPANT DESCRIPTION

Because public resources are limited, clients who receive home care services tend to be quite isolated and frail, many with both cognitive and physical limitations. Recruiting participants for the project proved to be challenging because case managers believed that many clients were too infirm to benefit from equipment or would be unable to participate in the interviews. Case managers also

reported client reluctance to be interviewed or to try out new devices. As a result, although the demonstration design had projected that 15% of the clients (225) from each of the two ASAPs would participate, the actual number recruited was much lower.

A total of 264 clients were nominated for the project (166 from WSES, 98 from SSES).<sup>1</sup> Of these, 196 (74%) received equipment during the demonstration period. There were a number of reasons why nominated clients did not receive equipment. Some clients became ill, died, or entered nursing homes (N=22). Others moved out of the catchment areas or had family caregivers move in, making them ineligible for home care services (N=10). Alternative ways of procuring equipment were found for some clients (N= 2). Other clients decided they did not want to receive equipment (N=30). Finally, staffing difficulties affected the capacity of one ASAP to disseminate equipment within the demonstration period (N= 6). As anticipated, attrition was higher among clients from SSES (43%) as compared to 16% for WSES because clients from SSES, the control site, waited six months to a year after initial recruitment before receiving equipment. Of the clients who received equipment, 102 from WSES and 42 from SSES were interviewed both before and after receiving equipment.<sup>2</sup>

Project participants were typically female (87%), white (97%), and unmarried (85%). Their ages ranged from 61 to 101 (median: 81 years). They typically lived alone (79%) in rented apartments (65%), were judged by case managers as having inadequate informal social supports (70%), and were not involved in any outside activities (78%). While almost half had fewer than two ADL deficits, nearly all had at least four IADL deficits. Participants typically received three to four paid services, from the home care and other programs. Nearly all used homemaker services. Other commonly used services included home-delivered meals, home health aide, transportation, skilled nursing, and personal care attendant. On average, participants received help with three daily living activities from informal caregivers.

Nearly half the clients who were interviewed rated their health as fair, with 20% as poor. About half the clients reported that preparing meals was difficult. Even though the majority (70%) of clients initially had at least one bathing device, 38% reported bathing to be difficult and 22% could not bathe

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<sup>1</sup> As the project unfolded, case managers recognized additional clients for whom equipment was appropriate; these individuals also received equipment but were not included in the research.)

<sup>2</sup> Not all clients who received equipment could be included in the evaluation component. A group of Russian-speaking clients could not be interviewed. Other clients were willing to try equipment but did not agree to initial or subsequent interviews.

without personal assistance. Over a third of the clients reported difficulties with getting dressed. The majority of clients regularly took medications, although few reported difficulties managing this activity. Engaging in expressive activities was reported as challenging by a third of the clients.

## IMPLEMENTING THE PROGRAM

A key component of the demonstration was training case managers to facilitate greater use of assistive equipment among their clients. As expected, case managers entered into the project with very limited experience with low-cost assistive equipment other than mobility (wheelchairs and walkers) and bathing or toileting aids. Most of the clients, particularly those who had never had serious medical incidents requiring intervention from rehabilitation specialists, were also unfamiliar with low-cost devices that might assist them with daily activities, and it was anticipated that they would be reluctant to try something new. Thus, a major challenge to the success of the project was familiarizing case managers with low-cost equipment and increasing their comfort level in recommending and encouraging clients to try devices.

A team of occupational therapists from Spaulding Rehabilitation Hospital designed and conducted a series of in-service training for case managers from both ASAPs. The goals of the training were to motivate case managers about the project and assist them in selecting and distributing appropriate equipment. The training was divided into two sessions for each ASAP and covered a number of topics including: the importance and role of assistive equipment in maximizing the independence of older people with functional limitations; an overview of currently available low-cost assistive equipment; simple methods for assessing clients' needs for assistive equipment; suggestions on how to analyze clients' living environments and daily living patterns to identify promising areas for introducing assistive devices; and techniques for encouraging clients to try equipment items.

As part of their training, case managers received a manual and a client assessment tool, developed by staff from the rehabilitation hospital, to assist them in making evaluations and recommendations for equipment. The assessment tool consisted of a check list of common activities that clients frequently have difficulty performing. The manual described a variety of low-cost items in terms of their function, client indications and contra-indications, cost, and source. The equipment items were cross-referenced in both the assessment tool and manual to facilitate the selection of appropriate devices based on clients' identified needs. Case managers were encouraged to consult with the training staff from Spaulding if they had questions about particular client situations.

As part of the intervention design, case managers were expected to review their case loads and identify clients who they believed would be good candidates for the introduction of assistive equipment. The premise of the demonstration was that this screening of clients would be based on information case managers received through the training. It was anticipated that, during home visits, case managers would work with their clients to decide on specific items to be ordered. Thus, selection of equipment items was based on a combination of case managers' assessments of clients' needs and clients' willingness to try out devices. The project allowed for an average of \$150 worth of equipment per client.

In practice, however, many clients were nominated before the trainings were completed in order to provide a sample for the research component, since participants were interviewed before receiving equipment. In some instances, case managers offered clients easy-grip jar and can openers to encourage them to participate in the projects. In other instances, case managers had identified items for clients before their training on assistive devices.

The ASAPs were expected to establish their own procedures for ordering items, tracking orders, and monitoring the delivery of equipment. These activities required substantial effort. Each ASAP assigned an equipment coordinator to manage the activities--in one instance a half-time volunteer, in the other, a paid administrative assistant. Once case managers had identified appropriate equipment items for a client, the equipment coordinator placed the order, tracked the status of the order, and reminded case managers of the scheduled follow-up calls to monitor clients' use of and satisfaction with the equipment.

The ASAPs developed procedures aimed at minimizing the additional demands on case managers required by the project. Case managers had typically made home visits to discuss equipment options. Equipment was shipped to clients' homes, thus relieving case managers of the need to make deliveries. To reduce paperwork and the number of follow-up calls required of case managers, orders were not shipped to a client until all items were available. This procedure sometimes resulted in lengthy delays when an item of equipment was back-ordered. The second home care agency eventually modified this procedure and had orders sent in stages when extensive delays for some items were anticipated.

Equipment policies were adopted that respected demands on case managers' time and that responded to case managers' concerns about client safety and personal liability associated with introducing equipment. Equipment distributed through the project was limited to items that did not require installation unless this could be arranged through family members or building maintenance personnel. Case managers, typically did not assemble or demonstrate the use of devices unless clients requested this help. Both activities would require a home visit after the equipment was received. Case managers' involvement with equipment assembly was further discouraged because of safety and liability concerns in the event that improper assembly led to equipment malfunction or client injury. Case managers would not authorize items they viewed as potentially dangerous if not fitted or used correctly (such as transfer boards) or items that are typically introduced by professionals (occupational therapists, nurses, etc.). While case managers concurred that equipment aimed at addressing expressive activities (such as book holders or scissors) could be beneficial, the policy was to provide these items after first addressing clients' functional needs.

Implementation of the project was delayed for several months while mechanisms for funding the assistive equipment were developed. In addition, the scheduled time lag for distributing equipment to clients from the comparison site was complicated by substantial case manager turn-over. In some instances, case managers were covering double case loads. As a result, there were delays of up to nine

months before many of these clients were able to receive equipment. On the other hand, as a result of the scheduled delayed intervention, staff from SSES were able to learn from the experiences of WSES, thereby streamlining procedures for ordering and tracking equipment and supplementing the training manual with colored photos of items (from a supplier catalog) to help clients select assistive equipment.

## EVALUATION FINDINGS

The evaluation was carried out at two levels. At a descriptive level, it assessed the extent to which case managers were successful in promoting low-cost assistive equipment to the target population of elders: by tracking the numbers, cost, and types of equipment items distributed through the project; by assessing the extent to which clients reported using the equipment they received; and by assessing client satisfaction with their equipment. At a more analytic level, the experiences of clients from WSES (the experimental group) were compared to those of clients from SSES (the control group) at Time 2 several months after the experimental group had received devices from the demonstration and before the control group received devices. Finally, the impact of the demonstration was further examined by analyzing changes for the entire sample.

### Descriptive findings

The evaluation relied on two sources of data regarding equipment distributed through the demonstration: records maintained by the ASAPs, which tracked equipment delivered to clients; and self-report data from participating clients who were interviewed. The extent to which clients were satisfied with and reported using their equipment was collected by both their case managers and the client interviews.

Distribution of equipment. Typically, clients possessed and used some low-cost assistive equipment prior to the project (**Table 1**). At baseline, clients reported using an average of seven items across the five domains, with half of these representing items to assist with bathing. There were a number of items reported by a majority of clients. These included a microwave oven for meal preparation; grab bar, tub-seat, hand-held shower, and non-slip bath mat for bathing; and easy-open pill bottles for medication management. Very little equipment was reported for expressive activities. There were no initial differences between the ASAPs in terms of the number of equipment items reported at baseline.

Approximately 20 case managers from each ASAP participated in the initial training on assistive equipment. As anticipated, there was considerable turnover among case managers during the study period. A few case managers left employment at the ASAPs, while others were reassigned to different positions within the agency, and still others exchanged all or part of their case loads with other case managers. Newly recruited case managers received training on assistive equipment from supervisors or other knowledgeable case managers.

Thirty-eight case managers (19 from each ASAP) assessed clients and distributed equipment through the demonstration. There was considerable variation in the intensity of case managers' engagement with the demonstration, as evidenced by the number of clients and the number of assistive items per client. Individual case managers distributed equipment to an average of 4.1 clients (ranging from 1 to 8 clients), with an average of 1.8 to 10 items of equipment per client.

Although case managers were encouraged to spend an average of \$150 per client for equipment as part of the demonstration, actual purchases were quite modest, both in cost and number of items (**Table 2**). Combining follow-up data from both ASAPs, clients received an average of four items (ranging from 1 to 15) at an average cost of \$19 per item (ranging from \$1 to \$209 per item). The average expenditure per client was well under budget--approximately \$76 per client exclusive of shipping costs. **Table 3** lists the percentage of items distributed by domain as well as frequencies for the items that were most commonly distributed. Nearly half the distributed items were associated with meal preparation or eating, followed by bathing or toileting, mobility (including reachers, walkers, and wheelchair accessories), and dressing equipment. Items to address expressive activities were less often distributed, in part, due to the ASAP's policy decision to address self-care before expressive needs.

Overall, WSES distributed assistive equipment to more clients (140) than did SSES (56). As reported in **Table 4**, however, SSES case managers distributed more equipment per client--an average of nearly five items compared to fewer than four for WSES. While there were no home care differences in terms of the number of dressing, meal preparation, or mobility items distributed, case managers from SSES distributed more bathing and expressive items than did case managers from WSES.

Group differences in bathing equipment may reflect differing policies at the two ASAPs that predated the project. WSES customarily used its Title III discretionary funds for bathing equipment to address issues of client safety, while SSES typically used these funds for respite services. Staff from SSES expressed a strong commitment to providing equipment that addressed clients' expressive needs, as well as activities of daily living.

Client benchmarks. Although the demonstration resulted in only modest changes in use of assistive equipment, client satisfaction benchmarks were quite high. Based on follow-up telephone calls by case managers two weeks after equipment was delivered, 71% of the clients reported using their equipment regularly, with another 16% using the equipment occasionally. Almost all clients (88%) reported being satisfied with their equipment, while only 6% expressed dissatisfaction and another 6% were unsure.

As part of the research interview, respondents reported similar satisfaction rates, with 63% of respondents reporting equipment received through the program as "very helpful" and another 22% "somewhat helpful." Many clients described specific ways in which equipment was helpful and provided an increased sense of independence. For example, one client who received a wall-mounted

electric can opener was thrilled because this was the first time since her stroke she could do anything without asking someone to help her. Another woman recovering from a stroke and hip replacement surgery was delighted on receiving a rolling cart that allowed her greater independence in managing her meals. Elders receiving reachers reported: “I’m able to pick up things on the bathroom and bedroom floors...,” and “It is now in constant use putting items away and taking items off my shelves.”

In the follow-up research interviews, over a third of the clients expressed a desire to speak with someone about additional gadgets or equipment. Fewer than 60% of the clients, however, recalled receiving a call or visit regarding their equipment after receiving it. The extent to which the difference between client and case manager reports of follow-up calls reflected confusion or poor recall on the part of elderly clients or lack of direct follow-up by case managers could not be determined. In the follow-up research interviews, the majority of participants mentioned one or more barriers to using equipment regularly. A third of these reported not needing an equipment item, while others reported finding an item difficult to use, not knowing how to use an item, forgetting to use the item, or that the item did not work as anticipated.

### Impact analysis

Group Comparisons. The premise of the study was that receiving equipment that addressed daily living areas presenting difficulty to elders would result in reports of decreased difficulty and greater ease with these tasks. At Time 2, once the experimental group had received equipment through their case managers, there were decreases in reported task difficulty for several of the activity domains among clients in the intervention group, but there were also similar improvements in many of these domains among the control group, who had not received equipment through their case managers (**Table 5**). Bathing was the only area for which reported changes diverged--the intervention group reported increased ease with bathing, while the control group reported more difficulty with bathing.

It was anticipated that case managers would distribute equipment that addressed clients’ reported task difficulties, and that, in turn, this equipment would result in greater reported ease in performing the associated tasks. We created measure outcomes (changes in equipment and perceived difficulty), “change variables”. Change variables were calculated by subtracting baseline scores from Time 2 scores for each outcome.

We first examined bi-variate associations between the change measures and variables that were expected to predict changes in the use of equipment or perceived task difficulty. Counter to expectations, perceived difficulties with daily living tasks at baseline were not associated with changes in equipment for any of the domains. This suggests that, typically, clients did not receive many assistive devices that addressed activities with which they had reported having difficulties. Moreover, changes in equipment were not associated with any changes in perceived difficulty with daily living tasks. This was not surprising, given the modest amount of equipment distributed and the lack of association between the types of equipment distributed and identified areas of need. We also looked at associations

between the change measures and a number of client characteristics: age, gender, residential status (living alone or with others), and health status. Client characteristics were not associated with either changes in amount of equipment or changes in perceived difficulty for any activity area.

A series of regression equations were run to further explore predictors of quantity of equipment at Time 2, one equation for each of four areas of equipment (meal preparation, bathing, dressing, and expressive). Predictor variables used in the equations included the treatment condition (being in the demonstration or control group); the measure of perceived difficulty with the corresponding activity at baseline; and the number of equipment items reported at baseline for the associated activity.

Very little variation in equipment change was explained by the models (**Table 6**). For food preparation, bathing, and expressive activities, having equipment at baseline negatively predicted receiving equipment at Time 2, suggesting that individuals who did not already have (many) equipment items in those domains were more likely to receive items. As expected, being in the experimental group also predicted receiving more items. However, clients' initial perceived difficulty with an activity did not predict receiving devices that might address those difficulties.

For dressing equipment, there was a different trend. For this regression equation, neither being in the intervention group nor baseline equipment was associated with receiving dressing devices. There was a weak association, however, between perceived dressing difficulty and receiving dressing equipment. Very few clients from either ASAP reported having dressing equipment at baseline. There was a significant increase, however, for both groups at Time 2. For this functional area, it appears that the modest increase in equipment (however it was acquired) was weakly associated with an initial assessment of dressing difficulty, regardless of treatment group.

Total sample. Follow-up data was collected for the control group participants once they had received equipment. The impact of the demonstration on the sample as a whole was then explored by combining data for the two groups of clients and by including data for eleven clients who were added to the study at Time 2. For these analyses, we used data collected during the first interview as baseline measures and data collected during the last interview as follow-up measures, regardless of the time period data represented (Time 1, 2, or 3).<sup>3</sup> Again, we investigated the extent to which clients'

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<sup>3</sup> Thus, data collection for the experimental, control, and added clients were as follows:

Time 1 Time 2 Time 3

expressed difficulties with performing daily living tasks predicted the assistive devices they received, and the extent to which assistive equipment received through the demonstration had a positive impact on clients' perceived ability to perform associated tasks.

An underlying premise of the demonstration was that clients, with assistance from their case managers, would select assistive equipment that addressed activities with which they were experiencing difficulties. For example, it was predicted that there would be an association between clients' perceived difficulty with meal preparation activities and the number of meal preparation devices received through the project (likewise for bathing, dressing, and expressive activities). This hypothesis, however, was largely unsupported by the data. Pearson correlations conducted between baseline summary measures of perceived difficulty and the number of items received through the project (as reported by the ASAPs) were largely non-significant. The only significant correlation was in the area of dressing; baseline perceived difficulty with dressing was associated with receiving dressing devices ( $r=.15, p<.05$ ). This association remained significant when baseline perceived difficulty and baseline dressing equipment were regressed on dressing equipment received through the project. Clients who reported difficulty with dressing activities, and, at baseline, reported minimal equipment to help with dressing tasks, were more likely to receive dressing equipment ( $F=6.4; \text{Adj. } R^2 = .10$ ).

As part of the evaluation interviews, participants were asked about their ability to do tasks associated with each area of daily living (meal preparation, bathing, dressing, and expressive activities) both at the beginning of the study and a few months after receiving equipment. Pre and post responses were compared to identify changes in perceived difficulty with performing tasks that might be attributed to using assistive equipment. Most commonly, there was no change in clients' perceived difficulty with performing tasks (**Table 7**), while in some instances, clients reported increasing or decreasing difficulty. Moreover, there were no significant associations between equipment received and improved ability to do a task. A confounding factor was that participants (home care clients who are typically frail with restricted abilities), continued to age, and in many cases, decline in functional abilities, independent of receiving equipment.

When regression equations were run with changes in perceived task difficulty as the outcome variables, for most areas of activity, task difficulty at baseline was the only predictor of changes in perceived difficulty. Clients who initially reported less difficulty with an area of activity were more likely to report greater difficulty with this area at the follow-up interview. The only instance for which

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Experimental group	X	X	
Control group	X		X
11 added clients		X	X

introducing equipment was associated with a reported decrease in task difficulty was bathing. Receiving equipment was associated with a decrease in reported difficulty with bathing ( $F=6.7$ ; Adj.  $R^2 = .11$ ).

Although we were not able to demonstrate measurable effects of the demonstration beyond distributing a modest amount of assistive equipment to home care clients, there was other evidence that the intervention was helpful. For example, clients who initially expressed difficulty reaching items in the kitchen were more likely to receive a reacher than were other clients, and clients who received a reacher were less likely to report difficulty with this task at follow-up. Many clients initially reported difficulty with opening cans and jars. Although initially expressed difficulty did not predict receiving a device, clients who received jar or can openers and indicated using them, typically reported decreased difficulty with this activity based on follow-up interviews.

Anecdotal information reported by case managers also revealed situations where the equipment was very helpful to clients. For example, a client with limited thumb mobility used “problem solving” with her case manager to identify devices to assist with meal preparation, bathing, and her hobby, painting. Solutions included a key lever; shoe fastener; and foam tubing, which her case manager used to build up handles of cooking utensils; a bath brush; and paint brushes. Along with the benefits, this case demonstrated some of the limitations of assistive equipment and the importance of case manager follow-up. Although her kitchen would not accommodate a one-handed, under-the-counter jar opener that her nephew attempted to install, her case manager was able to figure out a way she could successfully use a jar opener she already possessed. However, she was unable to find a button hook she could use with her thumb limitation.

## DISCUSSION

While the demonstration illustrated the potential for case managers to distribute low-cost devices within a state-funded home care program, typically, the intervention was very modest. On average, case managers provided clients with only four assistive devices. Moreover, these items tended to be distributed across a number of functional areas rather than a concentration of items in particular functional areas. In some cases, both clients and case managers expressed great enthusiasm for the devices. At the same time, there was little empirical evidence that the equipment that clients received was targeted to difficulties they were experiencing with specific components of daily living activities, and there was no measurable improvement in clients’ abilities to perform these activities.

The lack of empirical findings can partly be explained by the low intensity of the intervention, that is the typically small expenditure per client. The lack of findings may also be a reflection of the difficulties of devising measures that are sensitive enough to capture the individual circumstances of home care clients. It is also possible that the outcome measures we selected are not realistic, even if the intervention had been more intense. Other projects involving the provision of assistive equipment and home modifications (Mann, Ottenbacher, Fraas, Tomita, & Granger, 1999) reported continued declines in functional abilities despite intensive interventions. However, as can be seen from the investigation of

the impact of a particular item (reacher) that addressed a specific need, along with reports of client satisfaction, assistive equipment has the potential to improve client independence in small ways.

An important outcome of this demonstration was the identification of implementation issues to be addressed if home care programs are to be effective vehicles for disseminating assistive equipment. These issues do not present overwhelming challenges and could be addressed with relatively modest input of additional resources and effort.

#### Training of case managers

To successfully include assistive equipment as a regular home care service, case managers need comprehensive training on the potential benefits of equipment and on methods for working with clients on use of equipment. This training should include hands-on demonstrations of equipment items as well as a manual and a client assessment tool. Moreover, the high rate of case manager turnover, common among home care programs, necessitates that training about assistive equipment be included within the basic preparation of newly recruited case managers. (One of the participating ASAPs is now doing this.) If feasible, one case manager within a home care agency could become an assistive equipment “expert” who could train new case managers and serve as a mentor or consultant to others, for example, an occupational therapist who has prior experience with equipment or a case manager who has demonstrated comfort and enthusiasm with a range of equipment items. The ready availability of consultation from rehabilitation professionals is also needed.

#### Allocation of case manager time

For an assistive equipment program to be successful, time for determining clients’ equipment needs should be built into case managers’ assessment and reassessment schedules. Clients may be interested more readily in assistive devices if case managers bring devices with them for demonstration purposes rather than simply showing clients pictures of devices. By allowing a client to try an item, case managers may be able to determine whether a particular item is suitable for a client or whether another item for the same purpose may be needed. If case managers devote significant time to client assistive equipment needs, however, they will require a reduction in other responsibilities an adjustment in the size of their case loads.

#### Agency systems for ordering and delivering equipment

At the agency level, greater client use of assistive equipment would be facilitated by a well-developed system for ordering, delivering, installing, and monitoring equipment distribution. In the demonstration, the challenges associated with tracking, delivering, installing, and following up with clients were underestimated. Both agencies designated a central person to order the items, but this arrangement invited difficulties in communication between case managers and the purchasing agent. The agencies relied on hand-written forms to track equipment orders, delivery, and follow-through, and

most equipment was ordered through a catalog from a single supplier. Items requiring installation (such as grab bars and hand-held showers) were ordered only if the assistance of a case manager was not required for the installation, because case managers were uneasy about liability risks that might be attributable to in improper installation of devices. Equipment tracking became especially complicated when multiple items were ordered and some could not be shipped immediately. To minimize case manager burden, items were sent directly to clients, but this practice resulted in high shipping and handling costs. Typically, case managers made follow-up contact with clients (two days and two weeks after delivery) by telephone, which did not allow case managers to observe whether clients were using the equipment properly.

A number of strategies may help ASAPs overcome these difficulties:

- A computerized system could track the status of items ordered on behalf of clients.
- A supply of commonly-used items could be maintained within the agency to be made available immediately to clients.
- Home care agencies could experiment with a variety of equipment sources, including major catalog distributors, local health equipment companies that deliver equipment at little or no extra charge, and local department stores.
- Well trained volunteers could assist with the distribution of equipment. Volunteers might help with equipment delivery, installation of devices, training clients in proper use of devices, and follow up to determine client satisfaction with devices.

## CONCLUSION

This demonstration indicates the potential for expanding state-wide home care services to elders by having case managers, with appropriate training, assess, recommend, and procure low-cost assistive equipment as part of their routine client re-evaluations. Although it was not possible to demonstrate that providing low-cost assistive equipment resulted in measurable improvement in elders' functional independence or abilities to carry out daily tasks, client satisfaction benchmarks were high and instances were documented of clients' increased quality of life. A number of implementation issues were identified that should be addressed for successful introduction of assistive equipment by ASAPs. To include assistive equipment as a significant home care service, case managers require hands-on training on an on-going basis; clients need opportunities to try equipment options; and an effective equipment delivery system must be instituted.

**Table 1**  
**Baseline Assistive Equipment**  
 Client interview report <sup>4</sup> (N=216)

<b>Time 1 Equipment</b>	<b>Mean items</b>	<b>Range</b>
Total # items	7.4	(1 - 20)
Food preparation items	1.3	(0 - 6)
Bathing items	3.4	(0 - 6)
Dressing items	0.9	(0 - 6)
Medication management items	1.2	(0 - 4)
Expressive/mobility items	0.5	(0 - 4)

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<sup>4</sup> Table 1 reflects clients who completed pre-demonstration interviews at Time 1. Twenty-one clients who participated in the demonstration were not interviewed because they were non-English-speaking or chose not to participate in the research. Eleven clients were added to the project at Time 2. Sixteen clients, initially nominated for the project, died or became too ill to participate before the baseline interviews.

**Table 2**

**Equipment Distribution per Client by Activity Domain**

Total sample (N=196<sup>5</sup>)

<b>Domain</b>	<b>Mean items</b>	<b>Range</b>
Total equipment/client	4.0	1 - 15
Total cost/client	\$76	\$3 - \$604
Meal preparation and eating	1.6	0 - 8
Bathing and toileting	0.9	0 - 5
Dressing	0.4	0 - 5
Medication management	0.0	0 - 1
Expressive activities	0.3	0 - 4
Mobility	0.5	0 - 6
Miscellaneous	0.2	0 - 4

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<sup>5</sup> This table reflects all clients who received equipment as part of the demonstration, whether or not they completed interviews.

**Table 3**  
**Frequency of Equipment Items Distributed**  
 (Total of 780 items for 196 clients)

<b>Domain</b>	<b>% of total equipment</b>	<b>Items commonly distributed</b>	<b>Frequency</b>
Meal preparation/eating	40%	jar opener	92
		can opener	49
		peeler	19
		paring board	18
		eating utensils	17
		rolling knife	16
		no-slip padding	13
		oven-pull	13
Dressing	11%	spiral shoe laces	20
		sock aid	20
		button hook	14
		shoe horn	13
		zipper grip	7
		dressing stick	6
Bathing	23%	long-handled sponge	43
		bath rail/grab bar	22
		hand-held shower	21
		tub chair	17
		toilet (seat)	17
		no-slip bath mat	17
Mobility	13%	reacher	46
		walker basket/pouch	20
		cane	7
Expressive	7%	magnifier	15
		easy-grip pen	10
		book-holder	7
		easy-grip scissors	6
		easy-switch lamp	6
Other (cleaning, clinical)	5%		

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Medication management	1%	medi-planner	5
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**Table 4**  
**Group Comparisons of Distributed Equipment by Domain**  
(N=196)

	<b>WSES (N = 140)</b> <b>mean # items</b>	<b>SSES (N = 56)</b> <b>mean # items</b>	<b>signif.</b> <b>difference</b>
Total Equipment/client	3.6	4.8	**
Total cost/client	\$67	\$99	**
Meal preparation/eating	1.6	1.5	
Dressing	0.4	0.5	
Bathing	0.7	1.3	**
Mobility	0.5	0.5	
Expressive	0.2	0.6	***
Other	0.1	0.3	*
Medication management	0.0	0.0	

\* p <.05; \*\* p <.01; \*\*\* p <.001

**Table 5**  
**Group Comparisons of Time-2 Outcome Change-Variables**  
(N=159) <sup>6</sup>

<b>Change variable</b>	<b>Experimental (N=96) mean</b>	<b>Control (N=63) mean</b>	<b>Change diff. (p)</b>
Perceived Difficulty <sup>7</sup>			
- meal preparation	-.17 *	-.03	.06
- bathing	-.04	-.05	
- dressing	-.11	-.11 *	
- expressive	-.12 *	-.04	
Overall Ease <sup>8</sup>			
- meal preparation	+.22 *	+.25 **	
- bathing	+.22 *	-.05	.05
- dressing	+.08	+.10	
- expressive	+.23 *	+.24 *	
# ADLs	- .05	+.11	.10
# IADLs	+.14 *	0.16	
# Informal services	+.14 **	+.16 **	

<sup>6</sup> This table reflects participants who completed both baseline and T2 follow-up interviews.

<sup>7</sup> Negative change scores indicate a decrease in perceived task difficulty.

<sup>8</sup> Positive change scores indicate greater ease with regard to doing the task.

# Formal services	+ .23 *	+ .56 *	.009
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\*  $p < .05$ ; \*\*  $p < .01$

**Table 6**

**Predictors of Increases in Assistive Equipment  
OLS Regression Analyses (N=159)**

<b>Increased Equipment - Domain</b>	<b>Predictors of Increased Equipment</b>
Meal preparation	Member of intervention group Less meal equipment (T1)
Bathing	Member of intervention group Less bathing equipment (T1)
Dressing	Perceived dressing difficulty (T1)
Expressive/mobility	Member of intervention group Less expressive equipment (T1)

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**Table 7**

**Changes in Perceived Ease with Daily Tasks <sup>9</sup>**

N = 144

<b>Functional Domain</b>	<b>Reduced Difficulty</b>	<b>No Change</b>	<b>Increased Difficulty</b>
Meal preparation	42 (29%)	77 (54%)	25 (17%)
Bathing	43 (30%)	75 (52%)	26 (18%)
Dressing	39 (27%)	78 (54%)	27 (19%)
Medication Management	19 (13%)	94 (65%)	31 (22%)
Expressive	46 (32%)	75 (52%)	23 (16%)

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<sup>9</sup> Based on client assessment of how easy it is for them to perform each activity. Table summarizes change scores from participants from both groups who completed pre- and post-intervention interviews (While 196 clients received equipment, only 144 completed all interviews).

## **APPENDIX A**

### **Challenges Encountered with a Research and Demonstration Project**

#### **I. Challenges of a collaborative project (meshing service with research)**

The assistive equipment research demonstration project involved multiple collaborations that challenged the feasibility of simultaneously carrying out the research and intervention components of the project. The Massachusetts elder agency, Executive Office of Elder Affairs (EOEA), had conceived of the project jointly with the Gerontology Institute at the University of Massachusetts Boston, which served as principal grantee overseeing the project. EOEA makes policy decisions regarding state-funded elder services and provides oversight to the 27 area ASAPs. The ASAPs are independent, non-profit agencies charged with assessing potential home care clients and arranging appropriate services, and have broad discretion regarding how to carry out their programs. Although there was initial willingness by the two ASAPs to participate in the demonstration, the capacity for EOEA to provide effective oversight for the project proved challenging.

#### **A. Challenges of participant recruitment**

At the outset, EOEA and the two ASAPs challenged the original plans for subject recruitment. This ultimately jeopardized the sample size and, in some instances, the strategy for assessing clients for equipment. The research plan called for potential participants to be identified based on their appropriateness for equipment and an in-person interview. Once potential subjects were identified, passive consent procedures would be used for recruitment. The use of passive consent works as follows. Invitations to participate in the interview would be mailed to clients by the interview team from the Center for Survey Research (CSR), and targeted clients would have the option to notify the researchers if they were not interested. Those clients who had not notified CSR would be contacted by an interviewer who would attempt to recruit them into the study. Only after clients were interviewed by the research team would case managers talk with them about equipment needs.

Task force members from EOEA and the ASAPs felt strongly, however, that research interviewers should not contact potential participants until after clients had been informed of and agreed to participate in the demonstration. The result was that case managers were placed in a position of simultaneously recruiting clients for the research study (agreeing to an interview) and for the demonstration (agreeing to try equipment). This resulted in confusion on the part of many clients (who, understandably, could not distinguish between the two activities) and the refusal of many clients (who might have agreed to one or the other activity but not to both as presented.)

#### **B. Pressure to produce participants undermined training**

Using case managers to enlist study participants put unwelcome pressure on case managers to recruit enough clients for the study. As a result, in many instances, case managers had already visited

clients and spoken with them about the project and the benefits they would receive (specific equipment items) by agreeing to an interview. Thus, in many cases, case managers made equipment decisions at the time of recruitment, and never went back to assess clients' equipment needs more thoroughly once they had gone through the training.

#### C. Protection of clients

The interviewers were further constrained by agency concerns about protecting clients. Typically, CSR interviewers are instructed to follow up with potential participants who had initially indicated interest in participating, but subsequently declined. Sometimes subjects are confused at the time of the initial call or are contacted at a difficult time. Follow-up calls or unsolicited home visits can often reverse an initial refusal, without putting pressure on participants. Task force members from EOE and the ASAPs were concerned, however, about stressing or overtaxing clients and would not permit these recruitment strategies. This undoubtedly resulted in higher attrition and refusal rates than might have been otherwise.

#### D. Capacity of service providers to respond to research needs

A challenge to the project was developing strategies for carrying out the intervention activities within a schedule that was viable from a research perspective, while, at the same time, working within ASAPs' existing structure and case managers' routines as much as possible. While the ASAPs expressed a willingness to respond to research demands, in practice, this proved difficult for them to do. Project funds were allocated for a half-time program coordinator for each ASAP to oversee the demonstration and facilitate data collection activities (other than the client interviews). In both instances, ASAPs assigned an existing staff person to this role. An advantage of using existing staff in a supervisory capacity was that they were in natural positions to enlist case managers into the project. A disadvantage, however, was that these persons were stretched between competing responsibilities and unable to devote adequate effort to the project.

## II. Challenges of data collection within the context of an ongoing service program

The challenges to collecting data within the context of an ongoing services program are outlined in Table 8, along with potential solutions.

## Data Collection Problems and Potential Solutions

### Problems

1. Case managers found follow-up calls or visits too burdensome; often, it was not done.
2. Staggered delivery of items to individual clients made tracking difficult, but holding orders until complete caused long delays.
3. Assistive equipment follow-up forms bundled items together, making assessment of client satisfaction and usage unreliable.
4. Using paper forms to track assistive devices resulted in inaccuracies.
5. Photocopying hand-written client (re)assessment forms led to inaccuracies.
6. Client reassessment data did not correspond (in time) to other data collection.

### Potential Solutions

- Use case manager extenders (volunteers, aides, etc.) to follow up with clients on assistive equipment.
- Limit to 1 or 2 follow-up calls per client.
- Develop a computerized system for tracking assistive equipment.
- Have equipment orders shipped to the ASAP.
- Deliver equipment orders to clients in-person, by a case manager extender, if needed.
- Simplify the follow-up form to measures of satisfaction and use.
- Assess each equipment item (or related items) separately.
- Develop standard rules for assigning equipment items to categories on the interview guide.
- Assign project staff to maintain the equipment data base and transmit information to all parties involved.
- Have a project staff person abstract the needed information from the original forms.
- Encourage the use of a standardized MIS to record client data, which could be transmitted to the research team.
- Coordinate the research interviews with client reassessments by case managers.
- Make client information from the MIS database available to the research team.
- Assign project staff to coordinate client data collection.

### III. Intervention issues

#### A. Adequate training.

If case managers are to play a role routinely in assisting clients to acquire and adopt assistive devices, they need adequate training. This training should introduce case managers to the potential benefits of assistive equipment and familiarize them with available equipment options. Training must also provide hands-on opportunities for case managers to brainstorm situations where equipment could be helpful; guidelines to identify clients and circumstances for which equipment is indicated; guidelines for assessing clients for simple, low-risk equipment; and guidelines for referring clients for a professional evaluation for assistive equipment. Such training cannot be done in a few hours. Moreover, just as elders need time to assimilate new information, most case managers also need time to be converted to a new client service. Thus, training on assistive equipment should be provided in several short sessions, with periodic refresher trainings to update case managers on new products and to reinforce prior learning.

#### B. Client assessment process

Assessing clients for assistive equipment or environmental modifications needs could become a part of case managers' routine client assessment processes. However, this assessment will require additional case manager time, as well as adequate training. Including a standardized set of equipment-related questions within the client reassessment protocol would expedite the process, but, based on the experience of case managers with the Massachusetts demonstration project, additional time would also be required.

#### C. Equipment delivery and follow-up

The experience of the Massachusetts demonstration suggests that having equipment shipped directly to elderly clients is not effective. Case managers must be certain clients understand what they have received and know how to use the items. If items need assembly or installation, that must be arranged at the time of delivery. Clients' initial encounters with the equipment should indicate to the case manager how well clients understand how to use the items and whether further demonstration or support around the equipment is needed. Follow-up, by telephone or in person, is needed to reinforce use of the equipment. If possible, a family member should be engaged to learn how to use the equipment and to provide follow-up support. As has been reported in the literature on providing elders with assistive equipment, demonstration, practice opportunities, and caregiver support are needed for many clients to adopt devices effectively (Gitlin, Levine, & Geiger, 1993.)

#### D. Restrictions on equipment distribution

Case managers expressed considerable concerns about client safety and personal liability associated with introducing equipment. As a result, the ASAPs decided not to provide items that would require installation unless this could be arranged through family members or building maintenance personnel. Since most ASAP clients are socially isolated and many live in their own homes, this policy had implications for the project's ability to address some clients' needs. Case managers could not authorize items that require assessments by licensed occupational or physical therapists to ensure appropriate utilization. In addition, ASAPs decided not to offer items viewed as potentially dangerous when used without supervision (such as transfer boards).

There was initial disagreement about using public resources to fund equipment aimed at assisting with expressive activities, such as card-holders and TV-screen enlargers. EOEA and participating ASAP personnel decided that this type of equipment would be permitted but would be secondary to items that addressed clients' functional needs.

#### IV. Measurement issues

##### A. Organization of interview protocol did not match intervention

Because of constraints in planning and implementing the research and demonstration project, it was necessary to develop the client interview protocol before clients were assessed for equipment needs and before it was known what types of equipment items would be most commonly distributed to clients. ASAP staff, along with professionals from Spaulding Rehabilitation Hospital, participated with decisions on the content area of the client interview. Questions about the need for and use of equipment were thus focused on five domains considered critical to clients' well-being: meal preparation, bathing, dressing, medication management, and expressive activities. There were no sections to address general mobility, toileting, eating, or housework. With the intervention, it turned out that very little equipment addressing medication management was distributed. There is a relatively small range of available devices to address this area, and most people who needed medication reminders were already using them. Many clients, however, requested items to assist with general mobility, including walkers, accessories for walkers and wheelchairs, door handles, etc. A number of clients also received items to help with eating and toileting, areas not covered by the survey instrument. Finally, the expressive activities domain covered a wide scope of activities (from active hobbies to passive enjoyment of television) and functional limitations (difficulties with vision, hearing, as well as fine and gross motor mobility) thus challenging the selection of interview topics.

##### B. Challenges of designing valid outcome measures for a highly individualized intervention.

The intervention was intended to be customized to the unique needs and circumstances of participants. Moreover, each participant came to the project with different experiences around assistive equipment (from none to substantial experience). Thus, there was wide variation in the equipment that was requested and received by participants. This variability presented significant challenges to creating

a standardized instrument that would apply to the circumstances of each participant, yet would yield information that could be analyzed statistically.

For example, questions were developed to assess clients' difficulties with various aspects of bathing (getting into and out of the tub or shower, using soap, reaching one's feet, etc.). Many clients are no longer able to bathe or shower independently and rely on personal assistance or sponge bathing. While assistive equipment may make the bathing experience somewhat easier or safer, the standardized questions were not sensitive enough to capture small changes, especially for clients for whom bathing independence, even with equipment, was not a realistic goal.

Moreover, in a number of instances, devices were distributed that addressed activities that were not addressed by the interview instrument (toileting, grooming, house work, eating). Thus, measures of clients' perceptions of improved abilities were not comprehensive enough to investigate all the activities addressed by the equipment distributed through the demonstration.

In the few situations where questions addressing clients' capacities to complete a specific task (such as opening jars or cans) could be compared with corresponding equipment items that directly addressed this task (adaptive jar or can opener), improvement could be measured. In most situations, however, there was little direct correspondence between equipment items and questions about task ability. In other situations, where there were equipment items that matched an evaluated task (slicing food – rocker knife), there were not enough clients who received the item to measure the outcome statistically.

#### C. Problems categorizing equipment items

Another problem was that many items distributed through the project did not clearly apply to only one or to any of the five domains. For example, a reacher could be used for reaching items in a kitchen cupboard, for assisting with dressing, or with reaching an item dropped on the living room floor. Moreover, reachers were not explicitly included in the baseline questionnaire, although a number of participants volunteered information that they were using them. This presented challenges both to reliable assessment of reachers (since some clients who initially had reachers, had not mentioned it, while others received reachers after the baseline period) and to assessing the extent to which reachers addressed a difficulty associated with meal preparation (reaching kitchen cupboards) or with other domains.

There were similar difficulties with other items. Devices aimed at improving mobility, such as wheel chairs or walker baskets, had the potential of improving clients capacity to do a variety of activities (e.g., meal preparation, expressive activities).

#### D. Extraneous confounding factors

Clients' reports of devices they possessed were inconsistent from one interview to the next. In some instances, clients acknowledged having devices at baseline that they no longer acknowledged at follow-up. The reverse also occurred, with clients acknowledging items at follow-up that were not acknowledged at baseline or reported as being distributed through the project. In these instances, there was no way of knowing the extent to which these differences reflected actual changes, changes in recall, or increased understanding of the concepts in question.

## APPENDIX B

### Perceived Task Difficulty Scales

#### Items for Measuring Participant Perceptions about Task Difficulty

Are you able to..... (IF ABLE: How much of a problem do you have doing this: would you say a big problem, a little problem, or no problem at all?)

Meal preparation: Cronbach's alpha: Baseline: .746 Follow-up: .722

1. control the temperature settings on the stove?
2. open jars, bottles, or cans?
3. grasp pots or utensils?
4. slice food (bagels, vegetables, etc.)?
5. read food labels?
6. reach food or dishes in cupboards?

Bathing: Cronbach's alpha: Baseline: .821 Follow-up: .841

1. step into or out of the shower or bath by yourself?
2. wash your legs or feet by yourself?
3. keep steady while standing in the shower or bathtub by yourself?
4. adjust the water temperature by yourself?
5. hold on to the soap?
6. set down in or get up from the bathtub by yourself?

Dressing: Cronbach's alpha: Baseline: .875 Follow-up: .870

1. get your socks or stockings on by yourself?
2. get your shoes on by yourself?
3. tie or fasten your shoes by yourself?
4. get your shirt, sweater, or coat on by yourself?
5. fasten your shirt or coat by yourself?
6. get on and fasten your pants, slacks, dress, or skirt by yourself?

7. get your underwear (undergarments) on and off by yourself?

Medication management: Cronbach's alpha: Baseline: .598 Follow-up: .438

1. open pill bottles or jars by yourself?
2. pour or measure medicines by yourself?
3. remember when to take your medications?
4. remember when you last took medications?

Expressive activities: Cronbach's alpha: Baseline: .663 Follow-up: .616

1. understand what people are saying on TV?
2. see the TV screen clearly?
3. switch the TV or radio channels when you want to?
4. see print in books, magazines, or newspapers?
5. hold an open book?
6. grip a pencil, pen, or crochet hook.?

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