**#2006-04**
**January 2006**

# Public Funding and Support of Assistive Technologies for Persons with Disabilities

**by**

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The AARP Public Policy Institute, formed in 1985, is part of the Policy and Strategy group at AARP. One of the missions of the Institute is to foster research and analysis on public policy issues of importance to mid-life and older Americans. This publication represents part of that effort.

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## FOREWORD

As the U.S. population ages, we are focusing more on how to maintain a satisfying life for those who experience an accumulation of infirmities or disabilities. Both medical care and assistive services (such as personal care services and adult day services) play important roles in maintaining functioning in the community for older persons and individuals with disabilities.

In recent years, we have also witnessed continuing technological advances: the development of new materials and composites with desirable characteristics; sophisticated electronic circuitry that continues to shrink in both size and cost; growth in wireless communication systems; and design innovations that take advantage of these developments. These advances have focused attention on the potential of technology, in addition to health care and assistive services, to assist people with disabilities in functioning. However, it is not clear that assistive technologies' potential is being fully realized. Indeed, there is substantial evidence of unmet need.

Most of us think of health care programs as the primary sources of funding to meet our desire to maximize our ability to function. However, health care programs focus on health, not on functioning per se. Therefore, coverage of the range of assistive technologies may be incomplete and irregular under these programs. Other nonhealth programs may fund assistive technologies, but the programs may be limited in scope and magnitude. The net result of all of these factors is that people pay out of their own pockets for the largest portion of the costs of these technologies.

In order to gain a clearer understanding of the government role in supporting functioning through the use of assistive technologies, the AARP Public Policy Institute contracted with William Mann and the Rehabilitation Engineering Research Center on Aging of the University of Florida to collaborate with Marc Freiman, Senior Policy Advisor on the PPI Independent Living/Long-Term Care Team, to produce this report, "Public Funding and Support of Assistive Technologies for Persons with Disabilities". This report: presents detailed information on major government health care programs' coverage of assistive technologies; presents information on nonhealth care programs that support the use of assistive technologies by persons with disabilities; analyzes for three states the degree to which private sector programs are available to fill in the gaps in government coverage of assistive technologies; and provides estimates, where possible, of the costs of assistive technologies and of sources of payment.

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# Public Funding and Support of Assistive Technologies for Persons with Disabilities

## Executive Summary

## *Background*

As the U.S. population ages, Americans are focusing more on how to maintain a satisfying life for those who experience an accumulation of infirmities or disabilities. Both medical care and assistive services (such as personal care services, delivered meals, and adult day services) play important roles in maintaining functioning in the community for older persons and individuals with disabilities.

In recent years, our country has also witnessed continuing technological advances: the development of new materials and composites with improved weight, strength, durability, and/or other characteristics; sophisticated electronic circuitry that continues to shrink in both size and cost; growth in the types and effectiveness of wireless communication systems; and design innovations that take advantage of these developments. These advances have focused attention on the potential of technology, in addition to health care and assistive services, to assist people with disabilities in functioning.

However, it is not clear that assistive technologies' potential is being fully realized. Indeed, there is substantial evidence of unmet need. For example, a recent survey of persons age 50 and older with disabilities found that, among those who do not use any special equipment or assistive technologies to help with daily activities, 22 percent believe that some type of special equipment or technology could help improve their quality of life.

Most of us think of health care programs as the primary sources of funding to meet our desire to maximize our ability to function. However, health care programs focus on health, not on functioning per se. Therefore, coverage of the range of assistive technologies may be incomplete and irregular under these programs. Other nonhealth programs may fund assistive technologies, but these may be limited in scope and magnitude, and persons with needs for assistance may not be fully aware of them. The net result of all of these factors is that people pay out of their own pockets for the largest portion of the costs of these technologies.

## *Purpose*

The purposes of this report are to:

- present detailed information on major government health care programs' coverage of assistive technologies;
- understand the bases for these coverage provisions;

- present information on nonhealth care programs that support the use of assistive technologies by persons with disabilities;
- analyze for three states the degree to which private sector programs are available to fill in the gaps in government coverage of assistive technologies; and
- provide estimates, where possible, of the costs of assistive technologies and data on sources of payment.

## *Methodology*

**Categories for Assistive Technologies.** To facilitate discussion of the wide range of assistive technologies (AT), we organized them into the following categories:

*Personal Assistive Technologies for Activities of Daily Living* (bathing, dressing, eating, toileting, and transferring), but not including fixed housing modifications

*Personal Mobility Assistive Technologies*, such as walkers and wheelchairs, but not vehicles

*Prostheses and Orthotics*

*Hearing, Vision, Speech, Augmentative and Alternative Communication Technologies*, including eyeglasses, hearing aids, voice output equipment, Braille word processors, telecommunications devices for the deaf, and personal emergency response systems (PERS)

*Cognitive Assistive Technologies*, such as reminders to individuals of tasks to be done (e.g., taking pills or making a meal) and, possibly, to guide/monitor the specific steps in such tasks

*Private Transportation Assistive Technologies*, such as automobiles modified to accommodate a driver in a wheelchair and physical extensions of automobile controls

*Home Modification/Design (Fixed Devices and Design Features to Support Independence)*, such as handrails; elevators, ramps, and stair lifts; and widened doorways

This report does not discuss technologies for health care delivery, such as home dialysis. Also, it discusses only briefly AT embodied in public buildings, spaces, and transportation.

**Government Programs' Coverage of AT.** We determined the coverage of assistive technologies by specific government programs, primarily through documentation available on government Web sites, but also in some instances through calls or e-mails to obtain or verify details, or through coverage data already compiled by third parties.

**Medicare Spending Amounts for AT Categories.** We calculated Medicare expenditures for assistive technologies using data from the Centers for Medicare and Medicaid Services, after we created a list of billing codes that corresponds to each of the assistive technology categories.

**AT Coverage under Medicaid State Plans and Waivers.** We determined the coverage of assistive technologies under each state plan using existing survey results that we supplemented with information from state Web sites and, in some instances, with inquiries to state programs to resolve ambiguities. Because of the large number of Medicaid waivers, we limited our exploration of waiver coverage to home and community-based services (HCBS) waivers targeted to either "older persons" or "older persons and persons with disabilities." We used state Web sites as the primary sources of information for each of these waivers. Discrepancies were resolved by examining individual waiver applications/amendments and, in some instances, by calls to state governments.

**Detailed Examination of Three States.** To provide a clearer sense of the overall range of options that might be available to a person in need of assistive technologies, we present listings of all of the programs, both government and nonprofit, that we could identify in three specific states that were responsive in our initial investigations: Minnesota, Georgia, and New York.

## *Principal Findings*

Several government programs at the federal, state, and local levels fund or subsidize assistive technologies. Table S1 presents a simplified summary of which types of AT selected government programs cover, at least to some degree. The most important of these programs are Medicare and Medicaid and Veterans Benefits. However, the very designs of the first two programs limit their coverage of AT. Medicare and Medicaid are *health care* programs that generally require substantiation of *medical* necessity to cover an assistive technology, as opposed to substantiation of improvement in functioning, a broader concept.

As a result, Medicare provides only limited coverage of personal AT for activities of daily living (ADLs); items such as grab bars and raised toilet seats do not meet the criterion of medical necessity. Personal mobility AT such as canes, walkers, and wheelchairs are covered when determined to be medically necessary within the home. Hearing aids are not covered, nor are eyeglasses and other low vision aids generally. And cognitive assistive technologies, transportation AT, and home modifications are not covered at all. All told, Medicare payments for assistive technologies for calendar year 2002 amounted to just over $2 billion, and most of this total was for personal mobility AT and orthotics and prosthetics.

State Medicaid plans vary substantially in their coverage of assistive technologies. Roughly 80 percent of plans cover at least some types of assistive technologies for ADLs and for personal mobility. And almost all state plans cover prosthetics and orthotics to some degree, but a few states severely restrict this coverage. Almost all states cover eyeglasses and/or contact lenses, but a few states limit coverage to post-cataract surgery. Only about 60 percent of state Medicaid plans cover hearing aids, and roughly the same percentage cover some type of augmentative communication AT. None of the state Medicaid plans covers cognitive assistive technologies, transportation assistive technologies, or home modifications.

**TABLE S1: Summary of Coverage or Support of Types of Assistive Technologies by Selected Government Programs**

| | Health Care Programs | | | | Other Government Programs | | | |
|---|---|---|---|---|---|---|---|---|
| **Category of Assistive Technologies (AT)** | **Medicare[1]** | **Medicaid State Plans[1,2]** | **Medicaid Waivers[2]** | **Veterans Benefits** | **Older Americans Act** | **Selected Housing Programs** | **Supplemental Security Income IRWE & PASS[3,4]** | **Vocational Rehab-ilitation[4]** |
| **Personal AT for ADLs** | Some[5] | Yes | Some | Yes | No | -- | Yes | Yes |
| **Personal Mobility AT** | Yes | Yes | Some | Yes | No | -- | Yes | Yes |
| **Orthotics and Prostheses** | Yes | Yes | Some | Yes | No | -- | Yes | Yes |
| **Hearing, Vision, Speech AT, Augmentative Communication** | Little | Some | Some | Yes | No | -- | Yes | Yes |
| **Cognitive Assistive Technologies** | No | No | Some | No | No | -- | Yes | Yes |
| **Transportation AT** | No | No | No | Yes | No | -- | Yes | Yes |
| **Home Modifications** | No | No | Some | Yes | Yes | Yes | Yes | Yes |

1. Coverage needs to meet medical necessity criteria.
2. Due to state-by-state coverage variation, this column roughly represents the modal coverage by states.
3. IRWE = Impairment Related Work Expenses, and PASS = Plan for Achieving Self-Support. These provisions in effect subsidize AT for some individuals.
4. If AT helps enable the person to work.
5. In this table, “Some” means that while some items are covered, a significant portion of AT in this category is not covered.

Some AT that a state's plan does not cover may be covered under Medicaid waivers, which are an important effort to cover a much fuller range of services in the community for persons who otherwise would be in an institutional setting. In our examination of waiver programs for "older persons" and for "older persons and persons with disabilities," we found that the one type of assistive technology that is almost always covered is a personal emergency response system (PERS). Home modification, the next most frequently listed type of AT, is found in the majority of these waivers. However, no more than half of the waivers cover other AT categories. Very few cover transportation assistive technologies, and waiver coverage only applies to the limited number of persons enrolled in the waivers.

Veterans Benefits can cover at least portions of all of the categories of assistive technologies, although not all veterans receive the most comprehensive coverage. Eligibility is a function of the specifics of a veteran's situation, including his or her disabilities.

Vocational Rehabilitation**,** a state-run program funded by the federal government with matching state and local funds, may pay for assistive technologies that fulfill a vocational goal. No Social Security programs *directly* fund the purchase of assistive technologies. However, two provisions of the Supplemental Security Income program, a "Plan for Achieving Self-Support" (PASS) and "Impairment Related Work Expenses," in effect subsidize the purchase of assistive technologies for work objectives by some individuals with disabilities.

Some general conclusions emerge from Table S1. Programs designed to assist in functioning in employment have the potential to cover a broader range of assistive technologies. However, health programs, which focus on the concept of health (not *functioning* per se) and are largely based on a medical model of care, tend to have more limited coverage of AT, particularly in transportation AT and home modifications—the one exception being the limited Medicaid home and community-based services waivers. Also, each of these programs has different eligibility criteria, and some of them must operate within a fixed level of funding or number of persons to be served (housing programs, Administration on Aging programs, Medicaid waivers) and/or must prioritize among potential recipients according to nature of military service and disability (Veterans Benefits) or degree of need (vocational rehabilitation).

While it does not directly fund the purchase of AT, the Assistive Technology Act of 2004 creates and to some degree funds a number of mechanisms and projects. These include: increased coordination of federal efforts related to AT; state programs to provide information, assistance, and outreach with regard to assistive technologies; and optional state programs such as low-interest loan funds or loan guarantees to purchase or lease assistive technologies.

Finally, government regulations also play a role in promoting assistive technologies (including universal design), especially through improvements to public spaces and transportation, workplaces, and communication infrastructure. Among its objectives, the Americans with Disabilities Act of 1990 establishes a policy of providing reasonable accommodations to employees with disabilities in the workplace and mandates that physical barriers in shopping centers, restaurants, parks, etc., be removed or the service be provided in an alternate way. Other laws with such regulatory effects include the Telecommunications Act of 1996, the Architectural Barriers Act of 1968, the Air Carrier Access Act of 1986, and the Rehabilitation Act.

While this report focuses on government programs that support the use of assistive technologies, it appears that many nonprofit, private sector programs also play some role in funding AT, with great diversity in their scope and geographic range. Some programs focus on a specific type of disability or on the needs that result from a specific disease or condition. Assistive technologies are often not the primary focus of these programs, but rather are just one of several means to improve or maintain the functioning of targeted persons. While these programs vary significantly, one feature stands out: their budgetary scope is almost always limited.

It is difficult to estimate the total national level of spending on assistive technologies from all sources. Using the limited data available, we suggest that spending on assistive technologies for 2002 amounted to roughly $15–$20 billion. These data also indicate the substantial burden that assistive technologies place on individuals' finances, as the best data currently available indicate that over half the cost of assistive technologies is paid for out-of-pocket.

## *Concluding Comments*

The United States is slowly expanding its approach to aging and disability, beyond consideration simply of health and toward the broader concepts of functioning and independence. Technological innovations have allowed assistive technologies to play an increasingly greater role alongside assistive services, which remain integral to promoting functioning.

Functioning takes place within an environment, and substantial progress has occurred in making public buildings and spaces, the workplace, and travel and communication more accessible to persons with disabilities. Much of this progress has resulted from laws and regulations, rather than from programs that provide direct funding for assistive technologies.

But not as much progress has been made in equipping people with the assistive technologies that allow them to take advantage of these improved public venues, or with the AT and/or housing modifications that support the ability to live independently in one's own home. As a result, the functioning and independence of persons with disabilities is not being maximized.

Assistive technologies have the potential to relieve the effects of shortages of allied health and social services personnel. They also have the potential to assist family and friends who provide unpaid care, lessening the burdens and diminishing the caregiver burnout that contributes to institutionalization. And to those who interpret independence in part as meaning independence from human assistive services, assistive technologies hold even more promise. However, empirical analyses of the potential for substitution have not uniformly provided evidence of the replacement of services by technologies.

Overall, we found little coverage of cognitive assistive technologies, such as those designed to assist individuals in performing tasks at the appropriate time and in the proper fashion. One reason for this no doubt is that it is a relatively new and developing type of AT. Nevertheless, more than half of nursing home residents have some cognitive impairment, and more people are

recognizing that many persons with such impairments can be accommodated in less institutional settings. Assistance is still needed, and assistive technologies can play an important role.

Our society finds itself facing several important questions:

To what degree should there be more public funding of technologies that assist in functioning?

To what degree should additional public funding come from Medicare and Medicaid, which are primarily health care programs whose coverage determinations are based largely on considerations of medical necessity?

While these questions require a broad policy debate, we recommend the following:

States should provide broader coverage of assistive technologies in their Medicaid Section 1915(c) HCBS waiver programs. This would provide waivers with greater latitude to find the cost-effective combination of services and technologies that best enables each individual to avoid institutionalization, given the individual's needs and circumstances and the technologies and services available specifically to him or her.

More evaluation is needed of both the relative effectiveness and cost-effectiveness of assistive technologies. Innovation in assistive technologies will continue. With the potential for AT costs to expand rapidly, better processes are needed to direct funding to the most cost-effective types of AT.

More evaluation is needed to determine effective combinations of assistive technologies and assistive services. Integrated decision making needs to be improved, especially where funding of assistive technologies and assistive services is spread among several programs.

## 1.0 Introduction

As the United States population ages, we are focusing more on how to maintain a satisfying life for those who experience an accumulation of infirmities or disabilities. Medical care provides many treatments that deal with the sources of disability. At the same time, we are paying more attention to the broader concept of *functioning* in the community, which both medical care and nonmedical services and technologies can assist. The growth of the disability rights movement, including its focus on community-based care in the least restrictive environment, has enhanced this perspective.

Assistive services, long central to maintaining functioning among older persons and individuals with disabilities, come in many forms, such as skilled nursing and home health aide services; physical, occupational, and other therapies; homemaker and personal care services; companion services; delivered and congregate meals; transportation services; and adult day and respite services. Some of these services directly ameliorate a health condition, but others focus on enabling independent living, rather than on health per se.

With the quickening pace of technological innovation, assistive technologies are increasingly important as both substitutes for and complements to assistive services. An efficient consumer-oriented system of public funding to assist independent living would allow for flexible choice among a range of alternatives—technologies and services, medical and nonmedical—depending on the nature of the desired functioning and the individual's disabilities, environment, and preferences. But public programs frequently do not cover assistive technologies, and when such technologies are funded, it may be through separate programs that limit flexibility in resources use. As a result, most people pay for assistive technologies out-of-pocket, which results in unmet need among those who cannot afford it.

There can be no doubt that the range of assistive technologies is vast. The ABLEDATA Web site (http://www.abledata.com), sponsored by the National Institute on Disability and Rehabilitation Research, provides "information on more than 30,000 assistive technology products (over 20,000 of which are currently available), from white canes to voice output programs." Assistive technologies have the potential to relieve the effects of shortages of allied health and services personnel and to assist family and friends who provide unpaid or informal care, lessening the burdens and diminishing the burnout that can contribute to institutionalizing persons with disabilities.

Given the potential role for assistive technologies, and their incomplete and fragmented coverage among government programs, it is important to take stock of which programs pay for which technologies for which groups of persons. This is the primary objective of this report. First, we review the coverage of assistive technologies by government health programs, seen by some as the most likely source of public coverage. We next review other government programs that support the use of assistive technologies, including regulatory efforts. We then provide examples from three states of the range of programs that are available, including programs specific to individual states as well as nonprofit programs. We also present available data on spending for assistive technologies and conclude by discussing several related issues.

# 2.0 Methodology

## *2.1 Defining Assistive Technologies*

According to the Technology-Related Assistance for Individuals with Disabilities Act of 1988, the term, "assistive technology device," means "any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities."[1]

The Older Americans Act defines assistive technology (under Title I) as "technology, engineering methodologies, or scientific principles appropriate to meet the needs of, and address the barriers confronted by, older individuals with functional limitations."

While these definitions are broad enough to provide wide reach for legislation, they provide little indication of the range of products they encompass.

For this report, we define all types of assistance in functioning as belonging to one or the other of only two categories: assistive *services* or assistive *technologies*. Assistive services are not the focus of this report. What we call an assistive technology here covers a broad range of technologies and encompasses the many things that are not assistive services: prosthetics, orthotics, assistive devices, adaptive equipment, home and building modifications, universal housing design approaches that incorporate technological features that assist persons with disabilities, etc. Rather than list all of these terms each time, for the sake of brevity we simply call all of these "assistive technology" or "assistive technologies" and abbreviate this term as AT.

Given the breadth of assistive technologies, we divide them into a number of categories. Such categories are convenient for providing brief descriptions of the coverage of specific programs, most of which cover only specific subsets of AT. However, it is difficult to devise a categorization of assistive technologies that is both comprehensive and based on a single organizing principle. The specific type of functioning that is enhanced by AT may appear to be the most likely principle for organizing AT. But some AT is designed to enhance cognition or a specific sense (such as vision or hearing), and is not directly tied to a specific type of functioning. We therefore did not adopt a classification of AT that is organized around a single principle.

We created the following categories to span this inclusive spectrum of assistive technologies:

> *Personal Assistive Technologies for Activities of Daily Living (ADLs), Other than Mobility.* These technologies assist with bathing, dressing, eating, toileting, and transferring. They do not include immobile housing modifications, which are in a separate category below. Many of these technologies are relatively inexpensive, for example, bathtub and shower seats; long-

[1] Technology Related Assistance for Individuals with Disabilities Act of 1988, PL 100-407, section 3.

handled bathing brushes; button hooks and other aids for buttoning and zipping clothing; stocking and sock aids; reachers and grabbers; nonskid and high-sided plates; eating utensils, hairbrushes, combs, and toothbrushes with adaptive designs to assist with limited range of motion or gripping strength; commodes; and elevated toilet seats. Some other examples are more expensive, such as lift chairs that assist in rising up and/or transferring from a lying or seated position.

*Personal Mobility Assistive Technologies.* This category covers mobility assistance short of automobiles and public transportation, which are in a separate category below. These technologies can range from relatively simple and inexpensive canes and walkers through wheelchairs to expensive power wheelchairs and scooters. Probably at the most expensive and technologically advanced end are devices such as the iBot wheelchair, which can go up and down steps and rise up onto only two wheels so that its occupant, sitting on a seat that is now raised, can carry on eye-level conversations with people standing nearby.

*Prostheses and Orthotics.* This category includes devices used to replace a missing body part (for example, a limb) and braces to assist or stabilize malformed or weakened body parts (for example, splints, braces, supports). These devices do not necessarily assist with a specific ADL. This category is listed separately primarily because coverage of prostheses and orthotics is often separate from other types of AT coverage.

*Hearing, Vision, Speech, Augmentative and Alternative Communication Technologies*[2]. This category also does not focus on a specific type of functioning, but rather on sensory organs and communication. It includes eyeglasses, which are so common and relatively inexpensive that they are often taken for granted as an assistive technology that helps so many people function in society and in their homes. This category also includes hearing aids; voice output software and hardware for computers and the Internet as well as voice input interfaces; Braille word processors; closed circuit television (CCTV) apparatuses for individuals with low vision; a range of signal and "talking" systems for appliances and tools; telecommunications devices for the deaf (TDD and TTY); and communication hardware and software that convert speech to text and/or sign language and text to speech. Finally, this category includes personal emergency response systems (PERS) that allow an individual to communicate with specified numbers in case of emergency.

*Cognitive Assistive Technologies.* These technologies remind individuals of tasks to be done (such as taking pills or eating) and, in more experimental systems, to monitor the specific steps in these tasks. They may also provide information on a person's location and on the directions to a chosen destination. Some of these technologies may be monitored by family members or persons providing assistive services (such as at assisted residences or nursing homes).

*Transportation Assistive Technologies:* We divide this into two subcategories:

[2] Augmentative and alternative communication consists of methods that supplement natural speech, including signs and gestures, writing, alphabet boards, word charts, etc. Some augmentative communication systems incorporate electronic components such as computers and printers.

*Private Transportation:* These technologies facilitate consumer-owned or -leased transportation. Examples include automobiles modified to accommodate a driver in a wheelchair; wheelchair lifts; special seats; physical extensions of automobile controls; and hand-operated brake, clutch, accelerator, and steering column assemblies.

*Public Transportation:* These technologies facilitate transportation not owned or leased by the consumer. Examples include bus platform lifts for wheelchair users ("kneel down buses"); exterior wheelchair lifts to lift individuals who use wheelchairs or who have walking disabilities on and off trains; and specially equipped cabs.

*Building Modification/Design (Fixed Devices and Design Features to Support Independence):* We also divide this into two subcategories:

*Housing:* Some examples of home modifications are grab bars and handrails; elevators, ramps, and stair lifts; accessible counters and kitchen components; and lever door handles and wider doorways. In Medicaid waivers, these are often referred to as "environmental accessibility modifications."

*Public Spaces and Public Buildings:* This subcategory includes many of the same items as for housing above, and also items such as curb cuts and accessible toilets and washrooms.

While dividing up assistive technologies into these categories proves useful in this report, in several instances a program covers only a small subset of a single category.

This report does not discuss technology as it affects the delivery of health care, such as home dialysis machines and technologies used to transmit health/functioning-related data to service providers. Also, we discuss only briefly AT embodied in public transportation, public spaces, or public buildings.

## *2.2 Government Programs' Coverage of AT*

We determined the coverage of assistive technologies by specific government programs primarily through documentation available on government Web sites but also, in some instances, through calls or e-mails to obtain or verify details or through coverage data already compiled by third parties.

### 2.2.1 AT Coverage under Medicaid State Plans

We used a two-part methodology for determining coverage of assistive technologies by each state Medicaid plan. State plan coverage data for three specific categories—eyeglasses, hearing aids, and prosthetics/orthotics—were taken, with a few changes, from a survey by Health Management Associates (HMA)[3], released jointly by the Kaiser Commission on Medicaid and the Uninsured and the National Conference of State Legislatures (available at http://www.kff.org/medicaidbenefits/index.cfm).

[3] Health Management Associates collected the data in January 2003 using State Plans and State Plan Amendments submitted to the U.S. Department of Health and Human Services' Center for Medicare and Medicaid Services (CMS). Additional information was obtained from state Web sites and validation was requested from states.

Because the HMA survey did not focus on assistive technologies (other than the three specific items listed above), the University of Florida research team collected information on Medicaid state plan coverage of "Other AT." This process consisted of obtaining information from state Web sites and contacting some state Medicaid programs whose Web sites were ambiguous. (Web sites and other sources accessed are available from the authors.) Because a comprehensive survey of state Medicaid programs is an intensive process and was not the primary objective of this project, specific coverage details in the "Other AT" column may be incomplete for some states. For this "Other AT" category we use the categories described earlier.

### 2.2.2 AT Coverage under Medicaid Waivers

Because of the large number of Medicaid waivers, our exploration of waiver coverage of assistive technologies for this report focused on waivers targeted to either "older persons" or "older persons and persons with disabilities." First we identified waivers for these populations by searching each state government's Web site and performed a more general Web search as well. After identifying waivers for "older persons" or "older persons and persons with disabilities,", we compared these results with a CMS file that contained summary descriptions of all of the Medicaid 1915(c) waivers. We then resolved the few differences between these two sources.

Then we used state Web sites as the primary source of information on coverage of assistive technologies for each of these "older persons" and "older persons and persons with disabilities" waivers and compared these coverage findings with the summary description CMS file described above. Any differences were resolved, sometimes by examining specific waiver application/amendment documents (also available on the CMS Web site). In some instances, we called state governments in a final effort to resolve discrepancies or ambiguities. More information on this methodology and the Web sites consulted is available from the authors.

### 2.2.3 Medicare Spending Amounts for AT Categories

We calculated Medicare expenditures for assistive technologies using data from the Centers for Medicare and Medicaid Services, after we created a list of billing codes that corresponds to each of the assistive technology categories. More specifically, we calculated expenditures with data derived from the Medicare Part B Extract Summary System (BESS) for 2002. The specific Healthcare Common Procedure Coding System (HCPCS) codes that were used to construct the estimates for specific subcategories of AT are available from the authors.

## *2.3 Detailed Examination of Three States*

To provide a clearer sense of the overall range of options that might be available to a person who could benefit from assistive technologies, in this section, we present listings of the significant programs we were able to identify in three specific states: Minnesota, Georgia, and New York. We initially set out to collect information on a larger number of states. However, it was very difficult to obtain information, even with direct contacts with those familiar with assistive

technologies in their states. The three we chose were the most responsive in providing information. It may follow that these three states are also among the more proactive states in organizing information in support of reimbursement for AT and AT services.

## *2.4 Sidebar Examples of the Use of Assistive Technologies*

To put a human face on the use of assistive technologies, we provide brief descriptions between chapters of three real-world examples of how persons use assistive technologies to improve their daily functioning. These sidebars convey the actual experiences of older persons who use assistive technologies, and who participated in one or more research studies of the Rehabilitation Engineering Research Center on Aging at the University of Florida.[4]

[4] For more information on this center, see www.rerc.ufl.edu.

## Sidebar A

Mr. Baxter is a 66-year-old veteran who has faced a number of health problems over the past 20 years, including severe arthritis, peripheral vascular disease, and residual effects from a stroke he experienced in 1994. His limited use of his left side has challenged his mobility and fine motor coordination. He has a strong will to remain as independent as possible and does not have a live-in caregiver to assist him. Mr. Baxter has chosen to maximize his performance of many daily activities through the use of assistive technologies. He received a cane and a power wheelchair from the Veterans Health Administration (VA) and considers both devices very important for his mobility. He also uses a bath seat, which he purchased himself, and for leisure, a playing card holder. The VA also provided him with a jar lid opener and a rocker knife that have helped him with meal preparation. Additionally, Mr. Baxter wears eyeglasses that he purchased himself.

# 3.0 Government Health Care Programs and Assistive Technologies

While health and functioning are not identical concepts, they are related. As a result, many people look first to health care programs to seek coverage of assistive technologies. This chapter provides detailed information on AT coverage by three important government programs: Medicare, Medicaid, and Veterans Benefits.

## *3.1 Medicare*

Medicare is the health insurance program that covers persons age 65 and older, some disabled persons under age 65, and individuals with end-stage renal disease. If covered, assistive technologies are generally covered under Medicare as "Durable Medical Equipment, Prosthetics, Orthotics, and/or Supplies" (DMEPOS), and are typically paid for under Part B, which is an optional, supplemental plan that covers health care costs outside of the hospital. Individuals enrolled in Medicare Part B typically must pay a monthly premium. For Medicare to cover an assistive technology in the DMEPOS category, it must satisfy specific criteria, which include a physician's prescription and, in some cases, a "certificate of medical necessity" that must be obtained before furnishing the equipment.

### 3.1.1 The Concept of Medical Necessity and Its Importance for Medicare AT Coverage Decisions

Medicare is a *health* insurance program, which is an important characteristic in determining its coverage. Assistive technologies are designed primarily to assist in *functioning*, but under Medicare, coverage decisions are governed in part by the concept of "medical necessity." This concept is used to determine the fit between specific services and technologies and the objectives (and therefore the coverage) of the Medicare program, as developed and defined through laws and implementing rules and regulations.

The section of the Social Security Act that is the basic enabling legislation for Medicare does not provide sufficient breadth of detail by itself to make coverage determinations for assistive technologies using the concept of medical necessity.[5] *Implementation* of the Medicare program has resulted in the following three conditions that must be met for durable medical equipment expenses to be reimbursed under Medicare:

1. The equipment meets the definition of durable medical equipment.
2. The equipment is necessary and reasonable for the treatment of the patient's illness or injury or to improve the functioning of his malformed body member.

[5] **"**The term 'durable medical equipment' includes iron lungs, oxygen tents, hospital beds, and wheelchairs (which may include a power-operated vehicle that may be appropriately used as a wheelchair, but only where the use of such a vehicle is determined to be necessary on the basis of the individual's medical and physical condition …) used in the patient's home …, … and includes blood-testing strips and blood glucose monitors for individuals with diabetes … With respect to a seat-lift chair, such term includes only the seat-lift mechanism and does not include the chair." 42 U.S.C. § 1395x(n).

3. The equipment is used in the patient's home.[6]

Durable medical equipment is in turn defined as equipment that:

1. can withstand repeated use;
2. is primarily and customarily used to serve a medical purpose;
3. generally is not useful to a person in the absence of an illness or injury; and
4. is appropriate for use in the home.[7]

Implementation of these concepts has resulted in Medicare covering a broad range of assistive equipment related to medical treatment of such conditions as diabetes and emphysema and a range of prostheses and orthotics. But a number of assistive technologies are *not* covered by Medicare. By statute, Medicare generally excludes coverage of eyeglasses and other low-vision aids (except for one pair of conventional eyeglasses or contact lenses furnished after cataract surgery), hearing aids, and orthopedic shoes and other supportive devices for the feet (other than special shoes for individuals with diabetes).[8]

Tables 1 and 2 present selected examples of AT that are covered and not covered, respectively. For example, Medicare has been implemented to cover aids to ambulation such as canes, walkers, and wheelchairs when considered medically necessary within the home. However, Medicare coverage determinations have stated that grab bars, raised toilet seats, bathtub lifts, and bathtub seats do not meet the criterion of medical necessity.

**Table 1: Examples of Technologies Covered as Medicare DME**[9]

| Type of Technology | Qualification |
|---|---|
| Canes, walkers | If patient's condition impairs ambulation |
| Bed pans (autoclavable hospital type) | If patient is bed confined |
| Seat lifts | When prescribed by a physician for a patient with severe arthritis of the hip or knee and for patients with muscular dystrophy or other neuromuscular diseases |
| Speech-generating devices (augmentative & alternative communication devices) | If it is determined that the patient suffers from a severe speech impairment and that the medical condition warrants the use of a device |

[6] *Medicare Carriers Manual*, Part 3, Chapter II, Coverage and Limitations, Section 2100, available at http://www.cms.hhs.gov/manuals/14_car/3b2000.asp.
[7] *Medicare Carriers Manual*, Part 3, Chapter II, Coverage and Limitations, section 2100.1, available at http://www.cms.hhs.gov/manuals/14_car/3b2000.asp.
[8] 42 U.S.C. 1395y.
[9] *Medicare Coverage Issues* Manual, Durable Medical Equipment (at http://www.cms.hhs.gov/manuals/06_cim/ci60.asp#_1_8).

| Table 2: Examples of Technologies Not Covered as Medicare DME[8] | |
|---|---|
| **Type of Technology** | **Explanation** |
| White cane for use by a blind person | More an identifying and self-help device than an item that makes a meaningful contribution in the treatment of an illness or injury |
| Grab bars | Self-help device not primarily medical in nature |
| Raised toilet seats | Convenience item or hygienic equipment not primarily medical in nature |
| Bathtub lifts, bathtub seats | Comfort or convenience item or hygienic equipment not primarily medical in nature |
| Air conditioners, air cleaners, dehumidifiers, humidifiers | Environmental control equipment that is not primarily medical in nature |

### 3.1.2 Recent Issues Regarding Medicare Coverage of Power Wheelchairs

Implementation of the concept of medical necessity sometimes generates controversy. Recent events surrounding Medicare payment for power wheelchairs and scooters have underscored the difficulties of establishing and implementing coverage provisions for some types of assistive technologies in a program such as Medicare, which is administered with a focus on health rather than a broader focus on functioning.

Historically, the *Medicare Coverage Issues Manual* (in Section 60-9) stated that a wheelchair was covered "if the patient's condition is such that without the use of a wheelchair he would otherwise be bed or chair confined," and that a power wheelchair is covered if, in addition, "…the patient is unable to operate the wheelchair manually."

During the several years leading up to 2003, Medicare fee-for-service expenditures for power wheelchairs increased dramatically. From 1999 through 2003 the number of beneficiary claims for this equipment nearly tripled, and spending for power wheelchairs rose 450 percent, to reach an expected total of more than $1 billion.[10] The rate of growth was extremely high in the Houston area (Harris County); in 2002, 14 percent of Medicare's power wheelchair spending was for beneficiaries in Harris County, although only 1 percent of Medicare beneficiaries lived there.[11]

The wheelchair industry asserted that a good portion of the overall growth helped meet the goals of the Medicare program, as powered wheelchairs and scooters had recently become much more functional in a home environment, with technological improvements making them more compact and giving them a smaller turning radius. However, instances of fraud and abuse, which the industry denounced, were clearly also present. In 2003 the U.S. government indicted selected power wheelchair suppliers in Texas that were alleged to have billed Medicare fraudulently;

[10] "Medicare: CMS Did Not Control Rising Power Wheelchair Spending." Statement of Leslie G. Aronovitz, U.S. Government Accountability Office, before the Committee on Finance, U.S. Senate, April 28, 2004, p. 1.
[11] Ibid., p. 10.

revoked many Medicare power wheelchair supplier billing numbers; and initiated other activities "to ensure that Medicare pays for medically necessary wheelchairs for its beneficiaries."[12,13]

In December 2003, the DME regional carriers issued a policy "clarification" regarding power wheelchairs, which stated in part that:

> Power wheelchairs…are covered only for patients who are nonambulatory. If a patient can[not] bear weight to transfer from a bed to a chair or wheelchair, the patient is considered nonambulatory. …a power wheelchair is covered only if the patient is unable to self-propel a manual wheelchair within their home. …Although a power wheelchair may be useful to allow the beneficiary to move extended distances, especially outside the home, Medicare statute and national policy do not currently provide coverage for those uses.[14]

Numerous suppliers, producers, and beneficiary advocates objected to this policy "clarification", most fundamentally on the grounds that its implementation represented a narrowing of the definition of "medical necessity" rather than simply a clarification. The concern was that this policy issuance would be implemented to deny coverage of power wheelchairs to persons who could take even a single step. In addition, critics said that it was not clear how this clarification would help combat fraud. There was also continuing discussion of whether the intent of Congress in using the phrase, "in the home," in the Medicare law was to distinguish DME coverage from payment for equipment used in the hospital or in the nursing home, or was to indicate that coverage determinations should ignore community considerations outside of the four walls of a residence. In March 2004 CMS rescinded the clarification.

In December 2004, CMS initiated a process, called a "national coverage determination," which resulted in a proposed and then a final decision memorandum, each preceded by comment periods. The draft memo found that there is adequate evidence to determine that mobility assistive equipment is reasonable and necessary for beneficiaries with mobility deficits that impair their performance of what it called "mobility-related activities of daily living."[15] The decision memo deals with the continuum of mobility equipment, from canes through motorized wheelchairs and power scooters, and replaces the "bed or chair confined" criterion. It presents a sequence of clinical criteria to determine whether any type of mobility assistive equipment should be prescribed, and whether that equipment should be a cane or a walker, a manual wheelchair, a power scooter, or a power wheelchair. The sequence takes into account the beneficiary's physical capabilities and limitations, mental capabilities, the characteristics of the beneficiary's home environment, and the willingness of the beneficiary to use the equipment.

Comments on the memorandum included continued expression of the view that the limited focus on only in-home use can and should be dropped, and the proposal that mobility should be a goal in itself, not an activity valued only to the degree that it facilitates activities of daily living. It is

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[12] Ibid., p. 11.
[13] http://www.cms.hhs.gov/media/press/release.asp?Counter=843
[14] TriCenturion, LLC, "Region A DMERC PSC Bulletin," December 2003.
[15] "Proposed Decision Memo for Mobility Assistive Equipment" (CAG-00274N). Centers for Medicare and Medicaid Services, February 3, 2005**,** available at: http://www.cms.hhs.gov/mcd/viewdraftdecisionmemo.asp?id=143.

important to note that both the draft and the final decision memos explicitly state their focus on health, not functioning per se:

> The development of an assessment in support of Medicare coverage decisions is based on the same general question for almost all requests: "Is the evidence sufficient to conclude that the application of the technology under study will improve final *health* [emphasis added] outcomes for Medicare patients?"[16]
>
> Mobility is not included in the definition of [mobility-related activities of daily living] because, by itself, it does not serve a medical purpose.[17]
>
> Instrumental activities of daily living (IADLs) were not used in determining coverage since they are not limited to describing mobility functions in the home for a medical purpose…[18]

In August 2005, CMS published an "Interim Final Rule" on conditions for the payment for power mobility devices, which built on the national coverage determination and clarified the requirements for prescribing, supplying, and receiving payment for these devices.[19]

This series of events clearly demonstrates the tensions inherent in the process of covering some types of assistive technologies in a health program. The health orientation of the program, reinforced by a desire to constrain program costs, does not mesh well with the potential benefits of assistive technologies in improving functioning.

### 3.1.3 National Expenditure Data for AT under Medicare

Table 3 presents Medicare payments for assistive technologies. All together, Medicare payments for assistive technologies amounted to just over $2 billion in calendar year 2002. Payments for personal assistive technologies for activities of daily living (ADLs) other than mobility amounted to only $69.4 million. This figure is no doubt in part a result of Medicare viewing the benefits of much of this type of AT as being in the form of "convenience" and not being primarily "medical" in nature.

Sixty percent of all Medicare AT payments (almost $1.2 billion) were for personal mobility assistive technologies. In 2002, near the peak of the billing for powered mobility, Medicare paid roughly $700 million for motorized wheelchairs and power scooters.

Medicare paid almost $95 million for hearing, vision, speech, and augmentative and alternative communication technologies. Almost the entire amount was for vision AT (while the data do not provide this information, these payments were most likely after cataract surgery). Finally, Medicare spent a little over $700 million for orthotics and prosthetics. It is also worth noting

[16] Ibid.
[17] Decision Memo for Mobility Assistive Equipment (CAG-00274N). Centers for Medicare and Medicaid Services, May 5, 2005.
[18] Ibid.
[19] Federal Register, August 26, 2005 (42 CFR Part 410), pp 50940-50947.

that we found no Medicare payments at all for the following AT categories: cognitive assistive technologies, building modifications (such as ramps or elevators), or adaptive transportation.

**TABLE 3: Medicare Payments for Assistive Technologies, Calendar Year 2002**

| Category of Assistive Technologies (AT) | Medicare Payments[1] |
|---|---|
| **TOTAL** | **$2,062,409,976** |
| | |
| **Personal AT for Activities of Daily Living (ADLs)** | **$69,437,021** |
| | |
| **Personal Mobility AT** | **$1,195,866,210** |
| Canes, walkers, crutches, etc. | $80,320,052 |
| Manual wheelchairs | $414,921,414 |
| Motorized wheelchairs & power scooters | $700,624,745 |
| | |
| **Hearing, Vision, and Speech AT, and Augmentative and Alternative Communication Technologies** | **$94,904,018** |
| Vision | $87,552,669 |
| Hearing | $410,218 |
| Speech generation | $6,941,131 |
| | |
| **Orthotics and Prostheses** | **$702,202,726** |
| Orthotics | $341,850,848 |
| Prostheses | $360,351,878 |

[1] These figures do not include Medicare Advantage (HMO) expenditures.
Source: PPI calculations based on Medicare BESS data

## *3.2 Medicaid*

Medicaid is a federal/state-funded entitlement program that provides medical assistance to low-income persons with limited assets who are aged, blind, disabled, or members of families with dependent children ("categorically needy" categories), and in 35 states and the District of Columbia, for certain individuals with large medical care costs who are "medically needy." With respect to long-term services, we must distinguish between two parts of the Medicaid program: the basic state programs themselves and home and community-based services waiver programs. We deal with these two parts separately

### 3.2.1 Regular Medicaid State Plan Coverage

Medicaid differs from Medicare in terms of how assistive technologies are covered, because Medicaid does not recognize durable medical equipment as a separate coverable service. However, medical equipment is a mandatory component of the home health benefit, and this

benefit is mandatory under each state's Medicaid plan for individuals who are entitled to nursing facility services. Each state determines which equipment to cover.[20]

Medicaid also differs from Medicare regarding the concept of medical necessity, in that this is not defined in the basic Medicaid law. Each state can define medical necessity for itself, although state definitions are substantially similar.[21]

Table 4, which presents information on each state Medicaid plan's coverage of assistive technologies, shows whether specific categories of AT are covered but does not discuss whether special co-payments or payment methodologies are involved. Almost all states cover eyeglasses and/or contact lenses, but a few states limit the coverage to post-cataract surgery.[22] On the other hand, 40 percent of state Medicaid plans do not cover hearing aids. Almost all states cover prosthetics and orthotics; however, a few states severely restrict this coverage, such as limiting it to specific types of orthopedic shoes or for specific deformities. Roughly 80 percent of state plans cover at least some types of assistive technologies for ADLs and for personal mobility, but only about 60 percent cover some type of augmentative communication AT. None of the state Medicaid plans covers transportation assistive technologies or home modifications.

Because Medicaid does not recognize durable medical equipment as a separate coverage category, it is difficult to estimate spending on assistive technologies under state Medicaid plans. States have different coverage provisions, different payment levels, and different coding systems with different degrees of specificity for various types of equipment.

In addition, detailed data for many coverage categories are not provided to CMS for the managed care portion of Medicaid. The extent of managed care varies among states, and in some states it is sufficiently pervasive as to make the portion of care outside of managed care (for which detailed reporting is available) not necessarily representative of a state's overall Medicaid program.

Nevertheless, there have been increasing attempts to standardize Medicaid data into analytically useful categories, and CMS has aggregated Medicaid data across states and across procedure codes to generate estimates for 1999 for a category called "durable medical equipment/supplies." These estimates indicate that, in 1999, Medicaid spent roughly $990 million on this category.[23] We emphasize two caveats about this estimate: (1) some items included in this figure are either supplies or DME not considered as AT in this report (for example, blood glucose monitors, oxygen tanks, dialysis equipment), and (2) the estimate excludes DME provided through Medicaid managed care plans.

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[20] U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services, State Medicaid Director Letters SMDL #03-006, July 14, 2003; SMDL #01-011, January 19, 2001.
[21] Sindelar, Tim. "The 'Medical Necessity Requirement' in Medicaid," Boston MA: Disability Law Center, 2002.
[22] This discussion focuses on adults. Health care services identified under Medicaid's mandatory early and periodic screening, diagnosis, and treatment (EPSDT) program as being "medically necessary" for eligible **children** must be provided by Medicaid, even if those services are not included as part of the covered services in that State's plan.

[23] Derived from Medicaid Analytic Extract (MAX) files, Centers for Medicare & Medicaid Services, 2004, personal communication with CMS.

## TABLE 4: Coverage of Assistive Technologies under Medicaid State Plans

| | Coverage of: | | | |
|---|---|---|---|---|
| **State** | **Eyeglasses** | **Hearing Aids** | **Prosthetics/ Orthotics** | **Other AT**[1] |
| Alabama | Yes, CN[2] | No | Yes, for persons under 21;<br>otherwise, CN limited to prosthetic eyes or lenses, devices to close oral cavity necessary due to congenital deformity or surgery | CN—personal AT for ADLs, augmentative communication devices, personal AT for mobility (must be bed/chair confined for wheelchair, and wheelchair must increase mobility and independence) |
| Alaska | Yes, CN | Yes, CN | Yes, CN | CN—unable to locate further information |
| Arizona | Limited to post-cataract surgery, CN | No | Yes, CN, but not prosthetic eyes | CN—personal AT for mobility, personal AT for ADLs, augmentative communication devices |
| Arkansas | Yes, CN and MN[3] | No | Yes, CN and MN | CN & MN—communication AT, personal AT for mobility, personal AT for ADLs |
| California | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—hearing, speech, and vision AT; personal AT for ADLs; personal AT for mobility (includes iBOT); grab bars; and home modifications if necessary for home dialysis services |
| Colorado | Limited to post-cataract surgery, CN | No | Prosthetics: Yes, CN<br>Orthotics: No, but will cover orthopedic shoes for people with diabetes | CN—personal AT for mobility, communication AT, AT for ADLs |
| Connecticut | No | Yes, CN and MN | Yes, CN and MN | CN & MN—personal AT for mobility, personal AT for ADLs, speech-generating device |
| Delaware | No, but contact lenses covered only for specified conditions | No | Generally not covered but can be reviewed on case-by-case basis | CN—communication AT, personal AT for ADLs (will cover bathroom equipment if person requires a mobility device), personal AT for mobility |
| District of Columbia | Yes, CN and MN | No | Yes, CN and MN | CN & MN—unable to locate further information |
| Florida | Yes CN and MN; limited to contact lenses | Yes, CN and MN | Yes, CN and MN | CN and MN—communication AT, personal AT for ADLs, personal AT for mobility |
| Georgia | Yes, CN and MN | No | Yes, CN and MN; orthopedic shoes must be attached to brace | CN and MN—augmentative and alternative communication devices, personal AT for ADLs, personal AT for mobility, grab bars |
| Hawaii | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—personal AT for mobility, personal AT for ADLs, communication AT |
| Idaho | Yes, CN | Yes, CN | Yes, CN | CN—communication AT, personal AT for ADLs, personal AT for mobility, grab bars |

| | | | | |
|---|---|---|---|---|
| Illinois | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—communication AT, personal AT for mobility, AT for ADLs |
| Indiana | Yes, CN | Yes, CN | Yes, CN | CN—unable to obtain further information |
| Iowa | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—communication AT, personal AT for mobility, personal AT for ADLs |
| Kansas | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—only items that prevent or reduce hospitalization |
| Kentucky | No | Yes, CN and MN | Yes, CN and MN, but only items that prevent hospitalization | CN & MN—only items that prevent or reduce hospitalization—personal AT for mobility, personal AT for ADLs, communication AT |
| Louisiana | No | No | No | CN & MN—personal AT for mobility, AT for ADLs, communication AT under age 21 |
| Maine | Yes, CN and MN | No | Yes, CN and MN | CN & MN—communication AT, personal AT for mobility, personal AT for ADLs |
| Maryland | No | No | No | CN & MN—unable to locate further information |
| Massachusetts | No | Yes, CN and MN | No | CN & MN—personal AT for mobility, personal AT for ADLs, grab bars, communication AT |
| Michigan | Yes CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—personal AT for mobility, personal AT for ADLs, communication AT |
| Minnesota | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—communication AT, vision and hearing devices, personal AT for ADLs, personal AT for mobility |
| Mississippi | Yes, CN | No | No | CN—personal AT for ADLs, personal AT for mobility |
| Missouri | Yes, CN | Yes, CN | Yes, CN | CN—personal AT for mobility, communication AT, personal AT for ADLs |
| Montana | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—communication AT, personal AT for mobility, AT for ADLs |
| Nebraska | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—personal AT for mobility, communication AT, bathroom grab bars, personal AT for ADLs |
| Nevada | Yes, CN | Yes, CN | Yes, CN | CN—personal AT for ADLs, personal AT for mobility |
| New Hampshire | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—unable to locate further information |
| New Jersey | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN for post-trauma care and gross deformities | CN & MN—communication AT, personal AT for mobility, personal AT for ADLs, bathroom grab bars |
| New Mexico | Yes, CN | Yes, CN | Yes, CN | CN—communication AT, bathroom grab bars, personal AT for mobility, AT for ADLs |
| New York | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—unable to locate further information |
| North Carolina | Yes, CN and MN | No | No | CN & MN—personal AT for mobility, personal AT for ADLs |
| North Dakota | Yes, CN and MN | No | Yes, CN and MN | CN & MN—personal AT for mobility, personal At for ADLs, communication AT |

| | | | | |
|---|---|---|---|---|
| Ohio | Yes, CN | No | Yes, CN | CN—personal AT for mobility, communication AT, bathroom grab bars, personal AT for ADLs |
| Oklahoma | No | No | No | CN & MN—personal AT for ADLs, personal AT for mobility |
| Oregon | Yes, CN and MN | Yes, CN and MN | Yes, CN and MN | CN & MN—bathroom grab bars, personal AT for mobility, personal AT for ADLs, communication AT |
| Pennsylvania | Limited to post-cataract surgery | No | No | No |
| Rhode Island | Yes, CN | Yes, CN | Yes, CN and MN | CN & MN—personal AT for mobility, personal AT for ADLs |
| South Carolina | Limited to post-cataract surgery | Yes, CN | Yes, CN | CN—personal AT for mobility, personal AT for ADLs, communication AT |
| South Dakota | Yes, CN | No | Yes, CN | CN—personal AT for mobility, personal AT for ADLs, communication AT |
| Tennessee | No | Yes, depending on income | Yes, depending on income | CN & MN—unable to locate further information |
| Texas | Yes, CN and MN | Yes, CN and MN | No | CN & MN—personal AT for ADLs, personal AT for mobility, communication AT |
| Utah | Limited to post-cataract surgery | Yes, depending on income | Yes, depending on income | CN—personal AT for mobility, personal AT for ADLs |
| Vermont | No | Yes, depending on income | Yes, depending on income | CN—unable to locate further information |
| Virginia | No | No | Yes, CN and MN | CN & MN—communication AT, personal AT for mobility, personal AT for ADLs |
| Washington | Yes, CN and MN | Yes, CN | Yes, CN and MN | CN & MN—unable to locate further information |
| West Virginia | Yes, CN and MN | No | Yes, CN and MN | No |
| Wisconsin | Yes, CN and MN | Yes, CN and MN | Limited to post-surgery care | CN & MN—communication AT, personal AT for mobility, personal AT for ADLs |
| Wyoming | Limited to post-surgery | No | Yes, CN | CN—personal AT for ADLs, grab bars, personal AT for mobility, |

[1] Indicates coverage of at least some types of assistive technologies within the listed AT categories, but not necessarily all types within the category. For description of the various AT subcategories listed, see Section 2.1.
[2] CN = "Categorically needy" Medicaid eligibility.
[3] MN = "Medically needy" Medicaid eligibility.
Data Sources: State coverage of eyeglasses, hearing aids, and prosthetics/orthotics derived from a survey by Health Management Associates, providing data from January 2003 and released jointly by the Kaiser Commission on Medicaid and the Uninsured with the National Conference of State Legislatures (available at http://www.kff.org/medicaidbenefits/index.cfm). State coverage of "Other AT" is derived primarily from the University of Florida research team examination of state Web sites and inquiries made to state Medicaid programs. These Web sites and other sources are available from the authors.

### 3.2.2 Coverage of Assistive Technologies under Medicaid State HCBS Waivers

There is growing interest in providing assistance to persons in the community rather than in institutional settings. This interest reflects the desire of most people to live in the community as independently as possible and in the least restrictive environment. Also, costs may be lower outside of an institutional setting.

Medicaid waiver programs represent one important effort to cover and coordinate a range of services in the community for persons who otherwise would likely be in an institutional setting. Waiver programs are optional, but there is one or more home and community-based services (HCBS) waiver programs in every state except Arizona (which provides HCBS under a more comprehensive statewide Medicaid 1115 waiver). Section 1915(c) HCBS waivers, the most common alternative under the Medicaid program to providing long-term care in an institution, have been a source of growth in community-based services, increasing from $5.4 billion in FY 1995 to $21.2 billion in FY2004. Approximately one-quarter of Medicaid waiver expenditures are for programs for the elderly and/or disabled, with almost all of the remaining expenditures for programs targeted to persons with mental retardation or developmental disabilities. All of these waivers have limited funding and/or enrollment and may be limited geographically as well within a state.

Individuals receiving services under an HCBS waiver program must meet a hospital, nursing facility, or intermediate care facility level of care. States may offer a broad variety of services to participants under such a waiver, including nonmedical services and services that are not covered under the regular state Medicaid plan, as long as the provided services are necessary to avoid institutionalization, and the waiver costs do not exceed the average care costs for such individuals in an institution.

With regard to coverage of assistive technologies, CMS has noted, "Those adaptive aids that are not covered under a State Plan, as well as communication devices, can often be covered under Medicaid section 1915(c) waivers, other waivers or demonstrations."[24]

Because of the large number of Medicaid waivers, our exploration of waiver coverage of assistive technologies for this report focused on waivers targeted to either "older persons" or "older persons and persons with disabilities." Table A.1 in Appendix A presents detailed information on the coverage of assistive technologies for this subset of Medicaid waiver programs. We summarize the results here.

The one type of assistive technology that is listed under almost all of the waivers is a personal emergency response system (PERS), which is a very specific technology in the "Hearing, Vision, Speech, Augmentative, and Alternative Communication Technologies" category. The next most frequent type of technology listed, and one found in the majority of these waivers, is "environmental accessibility modifications," "home modifications," and related terms. This corresponds to our category, "Home Modification/Design (Fixed Devices and Design Features to

[24] U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services, State Medicaid Director Letter SMDL #03-006, July 14, 2003.

Support Independence)," and includes adaptations of the home such as grab bars, ramps, widening of doorways, and modifications of bathrooms.

Roughly one-quarter of waivers for older persons or older persons and persons with disabilities cover a category called "specialized medical equipment." This category is more ambiguous with regard to assistive technologies, as it also includes several types of items not relevant here, in addition to assistive technologies:

- devices, controls, or appliances (specified in the plan of care) that enable individuals to increase their abilities to perform activities of daily living;
- devices, controls, or appliances that enable individuals to perceive, control, or communicate with the environment in which they live;
- items necessary for life support;
- ancillary supplies and equipment necessary to the proper functioning of such items; and
- durable and nondurable medical equipment not available under the Medicaid state plan.[25]

So it appears that "specialized medical equipment" possibly covers personal mobility technologies, prostheses and orthotics, hearing, vision, speech, augmentative and alternative communication technologies, and cognitive assistive technologies. But we cannot determine the degree to which any of these specific types of AT is actually covered. It is worth noting that the description of "specialized medical equipment" provided above, and found in many states, covers devices that assist in performing ADLs as well as in perceiving, controlling, and communicating with the environment. These criteria appear to expand AT justifications, for the purposes of Medicaid HCBS waiver programs, beyond the concept of pure medical necessity.

One-quarter of the waiver descriptions indicate coverage of "assistive technology," "adaptive devices," or more specific types of AT such as mobility aids, eyeglasses, or hearing aids. Even if we combine all of these waivers with all of the waivers indicating coverage of "specialized medical equipment" (assuming that these latter ones include coverage of AT), waivers that cover AT beyond PERS and home modifications account for no more than half of all waivers targeting either older persons or older persons and persons with disabilities. Very few of the waivers include coverage of transportation assistive technologies.

In discussions with some state government representatives, we encountered situations where AT coverage was omitted from a waiver under the assumption that appropriate AT would be covered by the state's home health coverage. These situations highlight the inherent difficulty of providing assistance for functional limitations within a *health care* program. Medicaid has become the de facto long-term care program for low-income persons, and home and community-based services waivers represent an important attempt to shift this long-term care coverage from institutional to community-based care. Provision of this community-based long term care appears to represent an expanded focus on the functioning of the individual. However, in some cases decisions about coverage of assistive technologies, which can supplement and complement assistive community services, remain subject to the more narrow medical necessity standards applied under Medicaid home health services coverage provisions.

[25] See, for example, http://www.hss.state.ak.us/dsds/docs/HCBOA_waiver.pdf.

## *3.3 Veterans Benefits, TRICARE, and CHAMPVA*

Several programs provide health benefits to members and retirees of the armed forces, veterans, and their spouses and dependents. Some of these programs have special benefits related to assistive technologies that are more extensive than those found in private sector or other public sector health care programs. The range of technologies covered by specific programs is presented in Table 5, and we provide more details on eligibility below.

Veterans Administration.[26] Eligibility for Veterans Health Care Benefits is primarily determined by a veteran's status. Veteran status is achieved by active duty service in the armed forces and discharge under conditions other than dishonorable. Persons who served in the armed forces after roughly 1980 are generally required to have 24 consecutive months of active duty before they are eligible for veterans' health benefits. The 24-consecutive-month rule does not apply to several categories of persons, including reservists and National Guard members who completed the term for which they were called and veterans who have a service-connected condition or disability. If it is determined that a veteran is eligible for health care benefits, the veteran is assigned to one of eight priority groups for enrollment, depending on degree of disability, whether disability is service-connected, POW status, Purple Heart awardee, Medicaid eligibility, income and asset levels, and other factors.

The Medical Benefits Package is generally available to all eligible veterans regardless of their priority group. The Medical Benefits Package covers orthotics, prosthetics, eyeglasses, hearing aids, wheelchairs, and some personal AT for ADLs and communication.

As shown in Table 5, additional VA benefits are available for home improvements and adaptations, structural alterations, and automobile adaptive AT, depending on the veteran's specific conditions and disabilities.

While we were not able to obtain expenditure data on other specific types of AT for Veterans Medical Benefits, below are VA data for wheelchairs and scooters:

| Device | Cost (2001) | Number of Devices (2001) |
|---|---|---|
| Wheelchairs and scooters combined | $58,912,392 | 67,861 |
| Wheelchairs | $42,540,461 | 58,507 |
| Scooters | $16,371,931 | 9,354 |

Source: Hubbard, S.L., Fitzgerald, S.G., Reker, D.M., Boninger, M.L., Cooper, R.A., Kazis, L.E., Huang, Y.H., *Demographic Characteristics of Veterans Receiving Wheelchairs and Scooters from the Veterans Health Administration* (in preparation, 2004)

TRICARE. TRICARE (formerly CHAMPUS) is the health program for active duty armed forces service members. Other notable categories of people eligible for TRICARE are the spouses and unmarried children (up to age 21) of active duty service members, uniformed service retirees and their spouses and unmarried children, and former spouses of active or retired

[26] For eligibility and coverage, see http://www1.va.gov/elig/page.cfm?pg=1, http://www1.va.gov/elig/docs/Benefits_Guide_v4.pdf, and http://www1.va.gov/Elig/page.cfm?pg=10.

military (who had performed at least 20 years of service at the time the divorce occurred) who have not remarried.[27]

In 2001, new legislation improved TRICARE's coverage of assistive technologies. The law used broad new language to define durable medical equipment (DME) coverage as including "[a]ny durable medical equipment that can improve, restore, or maintain the function of a malformed, diseased, or injured body part, or can otherwise minimize or prevent the deterioration of the patient's function or condition."[28]

CHAMPVA. CHAMPVA is a health care benefits program for the spouse or widow(er) and for the children of a veteran who is (or was before death) disabled due to a service-connected condition, or who died on active duty. These dependents cannot be otherwise eligible for TRICARE benefits.[29]

[27] http://www.tricare.osd.mil/TricareHandbook/results.cfm?tn=3&cn=7

[28] Peter W. Thomas. "Congress Increases TRICARE Program's Coverage of Assistive Technology" at http://www.ppsv.com/issues/tricare_changes.htm.

[29] http://www.va.gov/hac/champva/champva.asp

## TABLE 5: VA, TRICARE, and CHAMPVA Coverage of Assistive Technologies

| Name of Program | Types of AT Covered | Eligibility Criteria |
|---|---|---|
| VA Medical Benefits Package | • Personal AT for ADLs<br>• Personal AT for mobility<br>• Vision and hearing AT<br>• Prosthetics and orthotics<br>• Communication AT<br>• Specific home modification and auto assistance, see below | See text above |
| VA Home Improvement and Structural Alteration Program (HISA) | Home modifications to continue treatment or to make home accessible: up to $4,100 for service-connected conditions; up to $1,200 for nonservice-connected conditions | $4,100 lifetime HISA benefit when necessary for service-connected condition, and some nonservice-connected conditions, depending on other aspects of veteran's status<br>$1,200 lifetime HISA benefit when necessary for treatment of a nonservice-connected condition, depending on other aspects of veteran's status |
| VA Specially Adapted Homes Program | Build, buy, or remodel adapted homes: maximum of $48,000 and not more than 50% of the cost to build, buy, or remodel<br><br>$9,250 grant for cost of adaptations; may also be used to help acquire a home that has already been adapted | Permanent and total service-connected disability, loss of or loss of use of both lower extremities, blindness in both eyes and loss of/loss of use of one lower extremity, or loss of/loss of use of one lower extremity AND residuals of organic disease or injury or the loss/loss of use of one upper extremity<br><br>Permanent and total service-connected disability due to blindness in both eyes or loss of/loss of use of both hands |
| VA Automobile Assistance | One-time payment of not more than $9,000 toward purchase of a personal vehicle; VA pays for adaptive equipment and for repairs and replacement required because of disability. | Service-connected loss/loss of use of one or both hands or feet or permanent impairment of vision of both eyes; veterans entitled to compensation for ankylosis (immobility) of one or both knees, or one or both hips, also qualify for adaptive automobile equipment |
| VA Foreign Medical Program | • Personal AT for ADLs<br>• Personal AT for mobility<br>• Prosthetics and orthotics<br>• Personal transportation AT | U.S. veterans with service-related conditions who are residing abroad |
| TRICARE (formerly CHAMPUS) | • Personal AT for mobility<br>• Eyeglasses and hearing aids under limited circumstances<br>• Prosthetics, orthotics if part of a brace<br>• Augmentative communication AT | See text below |
| CHAMPVA | • Personal AT for ADLs<br>• Personal AT for mobility<br>• Orthotics, orthopedic braces, therapeutic shoes for people with diabetes, prosthetics<br>• AT for health care delivery systems<br>• Personal vehicle AT | See text below |

Sources:

VA Medical Benefits Package:
http://www.appc1.va.gov/Elig/page.cfm?pg=1
http://www.appc1.va.gov/Elig/page.cfm?pg=10
http://www1.va.gov/pubaff/fedben/Fedben.pdf
http://www.va.gov/publ/direc/health/publications.asp?publ=handbook&order=Issue&dir=desc

VA Home Improvement and Structural Alteration Program:
http://www.va.gov/publ/direc/health/handbook/1173.14HB.pdf

VA Specially Adapted Homes Program:
http://www.pueblo.gsa.gov/cic_text/fed_prog/va_benefits/3-ben-progs.htm#home

VA Automobile Assistance:
http://www.pueblo.gsa.gov/cic_text/fed_prog/va_benefits/3-ben-progs.htm#home

VA Foreign Medical Program:
http://www.va.gov/hac/fmp/fmppolicy/fmppmchap2/2c2s9.pdf
http://www.va.gov/hac/fmp/fmp.asp
http://www.va.gov/hac/fmp/fmppolicy/fmppmchap2/2c2s10.pdf
http://www.va.gov/hac/fmp/fmppolicy/fmppmchap2/2c2toc.asp

TRICARE:
http://www.tricare.osd.mil/TricareHandbook/default.cfm

CHAMPVA:
http://www.va.gov/hac/champva/champva.asp
http://www.va.gov/hac/champva/policy/cvapmchap2/1c2toc.asp

## Sidebar B

Mr. Jones is a 72-year-old man with an extensive medical history. Though he has been diagnosed with diabetes, heart disease, prostate cancer, and gastrointestinal disorders, a stroke he suffered nearly 10 years ago introduced him to the use of assistive technologies. His recognition of the value of such devices has extended beyond rehab, as he has continued to seek additional technologies over the years. Mr. Jones has three devices that address his mobility impairment, all of which he considers very important: a walker, a standard wheelchair, and a quad cane. He received all of them during rehabilitation following his stroke. His insurance paid for these as they were necessary for his rehabilitation program. Mr. Jones also had grab bars installed in his bathroom and purchased a $200 raised toilet seat, which he paid for himself. He considers all these devices very important. Other devices he bought himself include a reacher and a button-hook. Mr. Jones also purchased with his own funds a computer that he uses for a number of important daily activities such as shopping and banking. Mr. Jones wears eyeglasses that he bought through his Medicare HMO for a $12 copay.

## 4.0 Other Government Programs that Support Assistive Technologies

The preceding section discussed the degree to which government health programs fund assistive technologies and revealed that coverage of AT among these programs was both incomplete and variable. This section explores the degree to which nonhealth government programs may fill these gaps by providing support for appropriate uses of assistive technologies. Many of these programs provide some funding for AT but do not have that as their primary focus. One program focuses on promoting assistive technologies but provides little funding for individuals to acquire AT. Finally, we describe the importance of several regulations in promoting adoption of AT.

### *4.1 The Assistive Technology Act of 2004*

The Assistive Technology Act of 2004 is the latest successor to the Assistive Technology Act of 1998 and previous similar acts that created an explicit role for government in promoting assistive technologies for persons with disabilities. While the Act does not directly fund the purchase of AT, it creates, and to some degree funds, a number of mechanisms and projects that enable the use of AT at the federal and state levels. The Rehabilitation Services Administration of the U.S. Department of Education administers the Act.

At the federal level, the Assistive Technology Act provides for increased coordination of federal efforts related to assistive technologies and universal design. It also authorizes funding for several types of grants to encourage: research and development for assistive technologies and universal design; improved training of rehabilitation engineers and technicians; and the study of assistive technology needs in urban and rural areas and of children and the elderly. It also provides funding for technical assistance programs and state protection and advocacy of the rights of individuals to access assistive technologies.

At the state level, the Assistive Technology Act requires states to support a public awareness program to provide information on the availability and benefits of assistive technology devices and services; promote interagency coordination that improves access to assistive technologies; provide technical assistance and training that promote access to assistive technologies; and provide outreach support to statewide community-based organizations, including focusing on individuals from underrepresented and rural populations. All states, territories, and the District of Columbia have Assistive Technology Act grant programs.

State programs funded under the Act also can also provide a range of optional activities, such as alternative state financing systems for assistive technologies for people with disabilities, which can receive a grant to cover the federal share of the cost of such an activity. These alternative systems might be in the form of, for example, a low-interest loan fund or interest buy-down program, a loan guarantee program, or a private partnership program for the purchase or lease of assistive technologies. Other optional state activities include providing technology demonstrations, distributing information about how to finance assistive technology devices and services, and operating a technology-related information system. They can also involve

equipment recycling programs and programs for the short-term loan of assistive equipment to be tried out before purchase.

## *4.2 Vocational Rehabilitation Services*

Vocational Rehabilitation (VR), established under the Rehabilitation Act of 1973, is a state-run program that is largely funded by the federal government (including some funds from Social Security) and matched with state and local funds. VR services seek to assist individuals with disabilities to prepare for, enter, remain in, or return to employment and pursue meaningful careers. State VR agencies provide a wide range of services, including restoration of physical or mental functioning, vocational training, employment counseling, rehabilitation technology services, and job placement and referral. The term, "rehabilitation technology services," used in the VR program includes provision of assistive technologies for persons with disabilities as long as the AT devices fulfill the individual's vocational goal. In 2002, rehabilitation technology expenditures totaled roughly $96 million.

Basic Eligibility Criteria. To receive vocational rehabilitation services, an individual must have a physical or mental disability (including a learning disability) that interferes with the ability to work and requires VR services to pursue employment. Potential employment outcomes encompass full- or part-time competitive employment to the greatest extent practical, including supported employment or other employment consistent with the individual's strengths, abilities, interests, and informed choice. The Rehabilitation Act Amendments of 1998 added self-employment, telecommuting, and business ownership as successful employment outcomes.

The disability of an individual need not be so severe as to qualify the person for Social Security Disability Insurance (SSDI) or Supplemental Security Income (SSI) benefits. The Rehabilitation Act Amendments of 1998 request that the VR agency first select individuals with the "most significant" (that is, most severe) disabilities to receive VR services, when a state does not have the resources to provide VR services to all eligible applicants. States are not required to consider financial need when providing vocational rehabilitation services, but some choose to establish a financial needs test or require their clients to share some service cost based on the client's financial situation. Most states have waiting lists for VR services.

Available Services. VR services are defined as "any goods or services to render an individual with a disability employable." Therefore, the range of services is wide, including counseling and job placement services; vocational and other training, including higher education and the purchase of tools, materials, and books; occupational licenses; personal assistance services while receiving VR services; physical or mental restoration to reduce or eliminate impediments to employment; supported employment; and interpreter services for individuals who are deaf and readers for individuals who are blind. More relevant to this report, provided services also include rehabilitation technology services (that is, AT), including vehicle modification, and telecommunications and other technological aids and devices.

Special Programs for Older Adults. Some VR agencies have special program for older adults. For example, the Alabama Department of Rehabilitation Services has a program for older state residents with visual impairments called Older Alabamians System of Information and Services (OASIS). OASIS is a federally funded program designed to assist persons 55 and older and

visually impaired in living more independently in their homes. Wyoming has an independent living center especially for older adults with vision impairments. AT services are included in these kinds of state programs, although these programs may not cover the entire cost of purchased AT.

## *4.3 The Older Americans Act*[30]

This law was enacted (and amended in 2000) to create equality in society for older adults. Among its objectives are "obtaining and maintaining suitable housing, independently selected, designed and located with reference to special needs and available at costs which older citizens can afford"; and "a comprehensive array of community-based, long-term care services adequate to appropriately sustain older people in their communities and in their homes."

Title III Part B of the Act addresses grants for supportive services. These supportive services cover a wide range, including housing services that provide "residential repair and renovation projects designed to enable older individuals to maintain their homes…; to adapt homes to meet the needs of older individuals who have physical disabilities," security modifications, and help in receiving assistance from Department of Housing and Urban Development programs.

The informational services supported by the Act include a service for older individuals that "provides the individuals with current information on opportunities and services available to the individuals within their communities, including information relating to assistive technology" (Section [29][A]). Also, ''client assessment through case management'' services may include providing information about assistive technologies.

## *4.4 Housing Programs*

Several Department of Housing and Urban Development (HUD) programs can assist lower-income older persons and persons with disabilities, including the Community Development Block Grants to cities, urban counties, and states to develop housing and expand economic opportunities, principally for low- and moderate-income persons, and HOME program block grants to state and local governments to create affordable housing for low-income households. Two programs in particular, Section 202 (of the Housing Act of 1959[31]) and Section 811 (of the National Affordable Housing Act of 1990[32]), focus specifically on lower-income older persons and persons with disabilities. These programs may include, but do not specifically focus on, persons who want to modify their existing housing to improve how they function in it.

The Rural Housing Service of the U.S. Department of Agriculture has several programs available to individuals for home renovations and repairs that can incorporate assistive housing

[30] Information in this section derived from http://www.hp.ufl.edu/ot/aarp_at_project/downloads/oaa_1965.pdf, http://dcss.co.la.ca.us/AAA/othertxt.htm, http://uscode.house.gov/DOWNLOAD/42C35.DOC.
[31] § 202, 12 U.S.C. § 1701q, 1994.
[32] American Homeownership and Economic Opportunity Act of 2000, Pub. L. 106-569, December 27, 2000, 114 Stat. 2944.

modifications. In particular, the Section 504 Home Repair Loan and Grant Program offers loans and grants for renovations to very-low-income families who own homes in need of repair, including providing funds to make a home accessible to someone with disabilities.

## *4.5 Social Security Administration*[33]

The Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) programs make cash payments to certain persons with disabilities. Such payments can be used to purchase assistive technologies, just as they can be used for any number of other purposes, but no Social Security Administration programs *directly* purchase, rent, or lease adaptive technologies.

However, two particular provisions of the SSI program in effect subsidize assistive technologies for some persons with disabilities. A "Plan for Achieving Self-Support" (PASS) is a provision that allows a person to use his or her income and/or resources to reach a work goal. The money set aside under an approved PASS is not counted when deciding eligibility for SSI and may increase the amount of SSI payments. One of the uses of income that could qualify as part of a PASS is the purchase of an assistive technology.

The other provision is "Impairment Related Work Expenses" (IRWE). Under this provision, when deciding eligibility for SSI and the amount of SSI payments, the government deducts from a worker's earnings the cost of certain impairment-related expenses that may be needed in order to work. Examples of impairment-related expenses are items such as wheelchairs, certain transportation costs, and specialized work-related equipment.

## *4.6 Government Regulations*

When we consider government support for assistive technologies, we tend to think of direct spending programs. However, the government can decrease individuals' direct out-of-pocket costs of assistive technologies in other ways. One of these is through the process of regulation.

The characteristics of public transportation and the modification/design of public spaces and public buildings are a key element of a person's ability to function. There has been substantial progress in making public buildings and spaces, the workplace, and travel and communication more accessible to persons with disabilities. Much of this progress has resulted from laws and regulations, the most relevant of which are described below:

> The Americans with Disabilities Act (ADA) of 1990, enacted to protect the civil rights of people with disabilities, has many implications for the adoption and use of assistive technologies, particularly in workplace accommodations and modification and construction of buildings, public spaces, and public transportation.

[33] Most of this section is based on e-mail correspondence with Frank Viera, Social Security Administration Press Office. More information is available at www.socialsecurity.gov/work.

Section 255 of the Telecommunications Act of 1996 addresses access to communications services for people with disabilities.

The Architectural Barriers Act of 1968 was enacted to ensure access to buildings that were designed, built, altered, or leased with federal funds.

The Air Carrier Access Act (ACAA) of 1986 was enacted to ensure that people with disabilities are not discriminated against when flying.

The Rehabilitation Act includes several sections that involve technological mandates, including that persons with disabilities should not be excluded or discriminated against in any program or activity that receives federal funds or that is carried out by the federal government; and that federal employees and community members with disabilities must have access to and use of information and data that employees and community members without disabilities are able to access and use.

Further detail on each of these acts is provided in Appendix C.

It is difficult to determine the true *added* costs of regulations. Modifications that incorporate assistive technologies might have been made regardless of the presence or absence of a regulation, due to changing perceptions of market demand, appropriate social behavior, or risk of litigation.

## Sidebar C

Ms. Smith is 76 years old and a recent widow after 53 years of marriage. After serving as a caregiver for more than ten years to her husband who had Alzheimer's disease, she has now begun to focus on her own health issues. Recent concerns have included limited endurance and lower extremity pain associated with arthritis and fibromyalgia, both of which have affected Ms. Smith's mobility. Her mobility impairment, along with diagnosed vision and hearing problems, have prompted her to seek assistive technologies to increase her independence and safety when completing daily tasks. She had grab bars and a raised toilet seat installed in her bathroom and paid for them herself. She uses a motorized lift chair, for which Medicare refused to reimburse her. She submitted a claim to her employer-based insurance company, which reimbursed her for 80 percent of the cost. A week later she received a letter saying the lift chair was not reimbursable. She ignored the letter and received no further ones. Additionally, Ms. Smith uses a reacher and a handheld magnifier, both of which she received from family members. She has a telephone with amplification adjustment, which was provided to her by the Florida Telecommunications Relay program at no charge. She purchased a pill organizer and eyeglasses with her own funds. Ms. Smith also bought a computer, which she uses for shopping, banking, and keeping in contact with friends and family.

## 5.0 Examples of the Range of Assistive Technologies Programs Available in Three States, Including Nongovernment Programs

As the preceding sections have shown, a range of government programs provides some degree of funding or support for assistive technologies. And a number of private sector (usually nonprofit) programs attempt to fill gaps in public program coverage of AT. To provide a clearer sense of the overall range of options that might be available to a person who would benefit from assistive technologies, this section presents listings of the significant programs that we were able to identify in three specific states: Minnesota, Georgia, and New York.

Federal programs that fund assistive technologies are potentially available to the residents of all states. However, state governments vary in establishing programs that fund AT. And there is great diversity in the scope and geographic range of the nonprofit programs that play some role in funding the use of assistive technologies. Some are national in scope, some are state-specific, and some may limit coverage to a specific area within a state. Some programs focus on a specific type of disability or on the needs that result from a specific disease or condition. A small number represent philanthropic efforts on the part of for-profit corporations that are tied to their primary business area. As is the case for many federal and state programs, assistive technologies are often not the primary focus of these programs, but rather are one of several means to improve or maintain the functioning of the persons targeted by the program.

The detailed descriptions of the public and private programs available to persons in Minnesota, Georgia, and New York are presented in Appendix B in Tables B.1, B.2, and B.3 respectively, and are summarized here.

Persons in all three states are potentially eligible for the federal programs: Medicare, the Social Security Administration programs "Plan for Achieving Self-Support" and "Impairment Related Work Expense," Veterans Benefits, and several housing programs. But the three states vary in their coverage of AT in the federal/state Medicaid program, as discussed earlier.

These states also vary in their state programs. Minnesota provides some coverage of assistive technologies in its medical programs that supplement Medicaid, in its alternative care program for older persons, and in its state housing program. New York also has a medical plan for low-income, uninsured persons not eligible for Medicaid, and programs that cover AT funded through the state's Commission for the Blind and Visually Handicapped and its Office of Mental Retardation and Developmental Disabilities.

State variation is also present in the area of telecommunications AT. Minnesota's Telephone Equipment Distribution (TED) Program, funded by a telephone surcharge on all private telephone lines, provides assistive telephone equipment to people who are deaf, hard of hearing, speech impaired, or otherwise need adaptive equipment to use the phone. The equipment is lent out at no cost as a long-term loan to qualified persons with a family income equal to or below specified guidelines. Georgia has a similar program that is managed by the Georgia Public Service Commission (PSC). However, the PSC contracts with the Georgia Council for the

Hearing Impaired, Inc., as its distribution agency. New York does not appear to have an equivalent program.

All three states have some form of AT coverage as part of their vocational rehabilitation and worker compensation programs. They also all have organizations that publicize and promote the use of AT (using Assistive Technology Act funds), although they vary in the degree to which they contract out these activities to private nonprofit organizations. To describe one program in more detail: the "Tools for Life" program is a service of the Georgia Department of Labor, Division of Vocational Rehabilitation, and is funded by a grant from the National Institute on Disability and Rehabilitation Research (NIDRR). Five Tools for Life Assistive Technology Resource Centers cover the state; their services include:

- assistive technologies scholarships and assistive technologies training;
- equipment loan library and online equipment exchange services for used or donated equipment;
- the ReBoot computer recycling program, which distributes rebuilt computers to persons with disabilities; and
- locating funding for assistive technologies through the Dollars and Sense Funding guide.

Nongovernment programs display both consistency and variation among the three states. Daimler-Chrysler, Ford, and General Motors all have similar national programs that provide some funding for automobile adaptations. Also, several nonprofit organizations focus on specific conditions or illnesses and have programs, generally nationwide, whose objectives include (at least in part) provision or funding of assistive technologies. Examples are programs run by the Association of Blind Citizens, the Hearing Foundation, the Multiple Sclerosis Society, Muscular Dystrophy, United Cerebral Palsy, and the National Federation of the Blind. Programs are also run by organizations such as Easter Seals, the Lions Clubs, and Statewide Independent Living Councils. Whether a particular organization has a project related to AT in a specific state varies. There are also nonprofit programs that are unique to specific states, such as the Catholic Charities Ramp Project and Mark's Computer Program in Minnesota and the project of the Georgia Council for the Hearing Impaired.

It appears from the examples of these three states that some state and many nonprofit programs attempt to fill the gaps in federal coverage of assistive technologies. To shed some light on the potential of these programs to fill coverage gaps, we attempted to obtain data on the dollar magnitudes of these programs, with partial success. Table B.4 in Appendix B presents data for the programs for which spending figures were available. To summarize, one particular feature stands out across these varied programs: their scope, as measured by funding or persons served, is almost always limited. Many of these programs have expenditures of under $2 million, and many allocate only a small portion of total program spending to assistive technologies.

## 6.0 What Do We Know about Overall Expenditures for Assistive Technologies?

It is difficult to estimate the overall level of spending on assistive technologies. Spending is regularly estimated for health care and its sub-categories, but as we have shown, many assistive technologies are not covered by health care programs that focus on medical care and health care services.

The National Health Accounts (NHA), produced by the Centers for Medicare and Medicaid Services, estimate expenditures for a "Durable Medical Equipment" category. Durable medical equipment is defined in the NHA as including "the retail sales of items such as contact lenses, eyeglasses and other ophthalmic products, surgical and orthopedic products, equipment rental and hearing aids." Therefore, most of the components *included* in this category are assistive technologies, but the category also *excludes* many assistive technologies—in particular, the entire categories of vehicle and housing modifications.

For the year 2002, the NHA estimate that $18.8 billion was spent on durable medical equipment, as shown in Table 6. Forty-five percent of this amount was paid for out of pocket, 31.4 percent was paid for by Medicare, and 18.6 percent by private health insurance. All Medicaid home and community-based waiver expenditures, including that portion spent on assistive technologies, are recorded in the "other personal health care" category of the National Health Accounts—none of them are allocated to the DME category. The zero level of payment for DME under Medicaid, while surprising, presumably reflects the fact that DME is not an explicit coverage category under Medicaid, even though more recent Medicaid administrative reporting efforts do attempt to generate data for such a category.

**TABLE 6: Durable Medical Equipment Expenditures and Sources of Payment, 2002**

| | Durable Medical Equipment |
|---|---|
| **Total Expenditures** | $18.8 billion |
| **Percent Distribution by Source of Payment:** | 100.0% |
| **Out-of-Pocket Payments** | 45.2% |
| **Private Health Insurance** | 18.6% |
| **Medicare** | 31.4% |
| **Medicaid and SCHIP** | -- |
| **Other government** | 4.8% |

Source: Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group, at http://www.cms.hhs.gov/statistics/nhe/historical/t9.asp.

The Medical Expenditures Panel Survey (MEPS) surveys the civilian noninstitutionalized U.S. population for a variety of measures, including health care use and expenditures and sources of payment for these expenditures. The MEPS provides spending estimates for a category that is broader than the DME category used in the National Health Accounts—this category, "All Other Medical Equipment and Services," includes expenditures for the purchase or rental of:

- vision aids, including eyeglasses;
- ambulance services;
- orthopedic items (includes canes, walkers, wheelchairs, etc.);
- hearing aids and other hearing devices;
- prostheses;
- bathroom aids (includes raised toilet seats, handrails, etc.);
- medical equipment (includes hospital beds, lifts, special chairs, oxygen, etc.);
- disposable supplies (includes bandages, dressings, diapers, IV supplies, etc.);
- alterations/modifications (includes ramps, handrails, elevators, car modifications, etc.); and
- other miscellaneous items or services.

Judging by this list, much of this category would be considered assistive technologies, and the majority of AT would be included in this category.

For the year 2002, $18.1 billion was spent on "Other Medical Equipment and Services," as shown in Table 7. Roughly 57 percent of this spending was paid for out of pocket, with private insurance paying for 20 percent and Medicare paying for only 10 percent. The MEPS data also allow for breakouts by age, and these show that only $6.4 billion of the total was for persons age 65 and over. For this age category, Medicare paid for a much larger proportion (24.1 percent), while private insurance paid for a much smaller proportion (11.7 percent).

While total 2002 NHA expenditures for durable medical equipment and 2002 MEPS expenditures for "Other Medical Equipment and Services" are nearly identical, the substantial differences in the definitions between these two categories make direct comparisons difficult. The 2002 MEPS shows Medicare spending on "Other Medical Equipment and Services" of only $1.8 billion. This is much less than the 2002 NHA estimate of Medicare payments of $5.9 billion for DME, but it is close the Medicare estimate of $2.1 billion specifically for AT spending that we calculated from summary claims data using specific AT codes, as presented in Section 3.1.3.

**TABLE 7: Expenditures for Other Medical Equipment and Services[1], 2002**

| Population | Total Expenditures (in $billions) | Percent Distribution of Total Expenses by Source of Payment | | | | |
|---|---|---|---|---|---|---|
| | | Out of Pocket | Private insurance[2] | Medicare | Medicaid | Other[3] |
| Total | 18.1 | 57.1 | 19.8 | 9.8 | 6.9 | 6.3 |
| Age 65 and over | 6.4 | 50.9 | 11.7 | 24.1 | 4.0 | 9.3 |

Source: 2002 Medical Expenditure Panel Survey at (http://www.meps.ahrq.gov/MEPSNet/TC/TC15.asp?File=HCFY2002&Table=HCFY2002_PLEXP)

1. About half the expenditures in this category were for vision items.
2. Private insurance includes TRICARE (Armed Forces-related coverage).
3. Other includes other public programs (e.g., Department of Veterans Affairs, Indian Health Service, community and neighborhood clinics, state programs other than Medicaid). It also includes Worker's Compensation; other unclassified sources (e.g., automobile, homeowner's insurance); and other private insurance (any type of private insurance payments reported for persons without private health insurance coverage during the year).

The 2002 MEPS estimates that Medicaid paid $1.25 billion for other medical equipment and services, slightly more than the $1.0 billion DME/supplies estimate presented in Section 3.2.1.1. However, this latter estimate excludes spending in prepaid (managed care) plans as well as spending on AT under Medicaid waivers.

Both the closeness of the MEPS estimate of Medicare spending on other medical equipment and services to our estimate of Medicare spending on assistive technologies, and the rough proximity of the MEPS estimate of Medicaid spending on other medical equipment and services to the Medicaid DME/supplies estimate, suggest that the total MEPS estimate for other medical equipment and services may be in the ballpark for overall spending on AT. The MEPS estimate also includes some spending for items such as disposable supplies and ambulance trips that are not assistive technologies, but any adjustments for these specific items would be imprecise. We therefore suggest that the data presented here indicate that spending on assistive technologies for 2001 may fall in the rough interval between $15 billion and $20 billion.

# 7.0 Discussion

## *7.1 Overview of Program Coverage of Assistive Technologies*

Assistive technologies take many forms, and individual government programs do not cover all of them. In order to gain a clearer picture of the overall effects of coverage under these programs, Table 8 presents a general summary of which types of AT are covered, at least in part, by selected government programs. It is important to note that all of these programs restrict who can receive their services. Medicare, the state Medicaid plans, and veterans' health plans are entitlements—but only for those who meet the base eligibility criteria. The other programs must work within a fixed level of funding or ceiling on the number of persons to be served (housing programs, Administration on Aging programs, Medicaid waivers) and/or prioritize among potential recipients according to nature of military service and disability (Veterans Benefits) or degree of need (vocational rehabilitation).

Medicare provides only limited coverage of personal AT for ADLs and generally excludes coverage for eyeglasses and hearing aids. The categories of cognitive assistive technologies, transportation AT, and home modifications are not covered at all. Medicaid state plans also do not cover these three categories. Medicaid waivers remedy these gaps in the regular state plans to some degree, but only for the limited number of persons enrolled in the waivers. Veterans Benefits cover all categories of assistive technologies, although not all veterans receive the most comprehensive coverage. Supplemental Security Income IRWE and PASS provisions have the potential to cover almost any type of AT, but the AT must be necessary to achieve a work-related goal.

Some general conclusions emerge from this table. Programs that are designed to assist in functioning in employment have the potential to cover a broader range of assistive technologies. However, health programs, which focus on the concept of health (not *functioning* per se) and are largely based on a medical model of care, tend to have more limited coverage of AT, particularly for transportation AT and home modifications. Veterans Benefits focus more on functioning and have a much broader range of coverage of AT than do Medicare and Medicaid, depending on a veteran's eligibility category.

## *7.2 Unmet Need for Assistive Technologies*

While this report describes a range of sources of funding for assistive technologies, this diversity does not imply that government programs and private nonprofit initiatives are the primary funding sources. Indeed, as described in Section 6, 57 percent of the MEPS expenditure category that includes most AT, "All Other Medical Equipment and Services," was paid for out of pocket. This high percentage indicates that assistive technologies are poorly covered by the major public health care programs and by the other sources as well.

## TABLE 8: Summary of Coverage or Support of Types of Assistive Technologies by Selected Government Programs

| | Health Care Programs | | | | Other Government Programs | | | |
|---|---|---|---|---|---|---|---|---|
| **Category of Assistive Technologies (AT)** | **Medicare[1]** | **Medicaid State Plans[1,2]** | **Medicaid Waivers[2]** | **Veterans Benefits** | **Older Americans Act** | **Selected Housing Programs** | **Supplemental Security Income IRWE & PASS[3,4]** | **Vocational Rehab-ilitation[4]** |
| **Personal AT for ADLs** | Some[5] | Yes | Some | Yes | No | -- | Yes | Yes |
| **Personal Mobility AT** | Yes | Yes | Some | Yes | No | -- | Yes | Yes |
| **Orthotics and Prostheses** | Yes | Yes | Some | Yes | No | -- | Yes | Yes |
| **Hearing, Vision, Speech AT, Augmentative Communication** | Little | Some | Some | Yes | No | -- | Yes | Yes |
| **Cognitive Assistive Technologies** | No | No | Some | No | No | -- | Yes | Yes |
| **Transportation AT** | No | No | No | Yes | No | -- | Yes | Yes |
| **Home Modifications** | No | No | Some | Yes | Yes | Yes | Yes | Yes |

1. Coverage needs to meet medical necessity criteria.
2. Due to state-by-state coverage variation, this column roughly represents the modal coverage by states.
3. IRWE = Impairment Related Work Expenses, and PASS = Plan for Achieving Self-Support. These provisions in effect subsidize AT for some individuals.
4. If AT helps enable the person to work.
5. In this table, “Some” means that while some items are covered, a significant portion of AT in this category is not covered.

The Consumer Assessments Study (CAS), a longitudinal study of the coping strategies of older persons with disabilities that focuses on their use of AT and was conducted by the Rehabilitation Engineering Research Center on Aging, provides additional evidence of the out-of-pocket burden of assistive technologies. From 1991 to 2001, 26 senior service agencies and hospital rehabilitation programs in western New York referred individuals whom they currently served to the CAS, or in the case of hospital rehabilitation programs, individuals they discharged home. The CAS was also replicated in northern Florida, for a total of 712 study participants. They reported owning a total of 9,080 assistive devices, or a mean of 12.75 devices each. Participants were asked who paid for the devices, and the responses are summarized in Table 9.

**TABLE 9: Sources of Payment for Assistive Devices in the Consumer Assessments Study**

| Who Paid for Device | Number of Devices | Percent |
|---|---|---|
| Self | 5,049 | 55.6 |
| Gift | 1,399 | 15.4 |
| Other* | 1,047 | 11.5 |
| Medicare | 934 | 10.3 |
| Medicaid | 276 | 3.0 |
| Supplemental Insurance | 169 | 1.9 |
| Borrowed | 117 | 1.3 |
| Rental-Medicare/Medicaid | 47 | 0.5 |
| Rental-Self/Medicare/Medicaid | 25 | 0.3 |
| Rental-self | 17 | 0.2 |
| Total Devices | 9,080 | 100.0 |

*AT purchased by VA, nursing home, vocational rehabilitation, and other nonspecific described funding sources and AT that involved a combination of out-of-pocket and Medicare or Medicaid funding.
Source: Mann W.C., J. Karuza, D. Hurren, and M. Tomita. Needs of Home-Based Older Persons for Assistive Devices: The University at Buffalo Rehabilitation Engineering Center on Aging Consumer Assessments Study. *Technology and Disability* 2(1) (1993): 1–11.

About 70 percent of the devices were paid for privately, either out-of-pocket or as gifts (although these devices may have been, on average, less expensive ones). Medicare covered 10 percent of the devices, and Medicaid paid for only 3 percent of the devices over the study period. Rentals, regardless of who paid for them, accounted for only a small portion of the AT devices.

There is evidence that this high reliance on out-of-pocket financing results in unmeet needs. A recent survey of persons age 50 and older with disabilities found that, among those who do not use any special equipment or assistive technologies to help with daily activities, 22 percent felt some type of special equipment or technology could help improve their quality of life. Among those who specified the types of technology needed, those most commonly named were: wheelchairs or scooters; hearing aids; walkers, canes, or crutches; aids for bathing or using the

toilet; and orthopedic equipment.[34] With regard to home modifications, a 2003 survey found that 24 percent of persons age 65 and older with at least some degree of activity limitation "see the need for significant, often costly modifications to enable them to remain living in their homes over the next five years."[35] Other studies found unmet need in specific population subgroups, such as older persons with visual impairments[36] and those with arthritis.[37]

## *7.3 The Context for Coverage of Assistive Technologies*

While this report focuses on coverage of and funding for assistive technologies, several related areas merit brief discussion.

**Services that Accompany Assistive Technologies.** Efficient use of AT involves more than buying it. For some types of AT, it is important for the fit and design to match the specific needs of the individual, and for some types of AT it is important that the user be knowledgeable about its proper use to ensure that individual needs and specific assistive technologies are combined in an efficient and cost-effective manner.

The Assistive Technology Act explicitly recognizes the value of these services, which it defines as "any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device." These AT services can include:

- a functional evaluation of the technology needs of an individual in the individual's customary environment;
- assistance with purchasing, leasing, or otherwise obtaining assistive technologies;
- coordinating the use of assistive technologies with other therapies, interventions, or services; and
- training and technical assistance with assistive technologies for an individual with a disability and also, where appropriate, the family of an individual with disabilities, employers, or other individuals who are substantially involved in the major life functions of individuals with disabilities.

**Coordination and Integration of AT Programs.** As this report has shown, coverage of assistive technologies is fragmented among a range of programs, with only a few covering a broad range of AT, and with many covering only selected technologies as part of broader program objectives. Furthermore, some programs are separate from health care programs and also from programs that provide nonmedical assistive services to persons who need them. This high level of segmentation among health programs, assistive technologies programs, and some

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[34] Gibson, Mary Jo et al. *Beyond Fifty 2003: A Report to the Nation on Independent Living and Disability*. Washington, D.C.: AARP, 2003, p. 149.

[35] Feldman, Penny H., Mia R. Oberlink, Elisabeth Simantov, and Michal D. Gursen. *A Tale of Two Older Americas: Community Opportunities and Challenges, AdvantAge Initiative 2003 National Survey of Adults Aged* 65 *and Older*. Center for Home Care Policy and Research, Visiting Nurse Service of New York, April 2004.

[36] Mann, W. C., D. Hurren, J. Karuza, and D. W. Bentley. Needs of Home-Based Older Visually Impaired Persons for Assistive Devices. *Journal of Visual Impairments & Blindness* 87(4) (1993): 106–110.

[37] Mann, W., D. Hurren, and M. Tomita, M. (1995). Assistive Devices Used by Home-Based Elderly with Arthritis. *The American Journal of Occupational Therapy* 49(8) (1995): 810–820.

assistive services programs may make it difficult to determine and provide in a coordinated fashion the specific combination of services and technologies that most efficiently and cost-effectively assists individuals in functioning, given their preferences, needs, and environment.

In those few instances where a high level of coordination is possible, we know little about the integration of AT. For example, PACE (Program of All-Inclusive Care for the Elderly) is a capitated benefit that features a comprehensive service delivery system and integrated Medicare and Medicaid financing that permits most participants to continue living at home rather than be institutionalized. Capitated financing allows providers to deliver the goods and services that participants need, including assistive technologies, rather than be limited to what is reimbursable under the Medicare and Medicaid fee-for-service systems. Nineteen states have either approved PACE providers or have applications pending[38]; however, little information is available about how well PACE integrates AT into the range of options available to program participants.

**Private Health Insurance Coverage of AT.** This report focuses on government coverage of assistive technologies, but it is important to note that such coverage (or its lack) can have impacts beyond the government sector. In particular, coverage decisions made under the Medicare program can be used as a "model" for private health insurance coverage of AT. Because private health insurance is the only type of insurance most people have that may cover assistance in functioning, the spillover effects of Medicare coverage decisions, made largely on the grounds of medical necessity, can be substantial.

**The Costs and Cost-Effectiveness of Assistive Technologies.** In a world of budget constraints and scarce program dollars, it is important to incorporate a sense of costs and benefits to society when making funding decisions for assistive technologies. Some needs may suggest a range of technological choices: several similar models of a single specific technology may be available, and a broader range of technological approaches may be relevant; some approaches may even combine a mix of technologies from several categories (for example, a combination of personal mobility AT and home modifications to enhance mobility within the home or the ability to leave the home).

Several controlled trials have documented the positive impact of assistive technologies (and home modifications in particular) on independence and even on health related costs.[39,40,41] But more research is needed to yield a more complete picture of the benefits of assistive technologies, both relative to their costs and to other options, including assistive services.

**Interactions between Assistive Technologies and Assistive Services.** Both assistive technologies and assistive services have the potential to maintain and improve independence;

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[38] http://www.cms.hhs.gov/pace/pace-map.asp

[39] Mann, W. C., K. J. Ottenbacher, L. Fraas, M. Tomita, and C. V. Granger. Effectiveness of Assistive Technology and Environmental Interventions in Maintaining Independence and Reducing Home Care Costs for the Frail Elderly: A Randomized Trial. *Archives of Family Medicine* 8(3) (1999):210–217.

[40] Close, J., M. Ellis, E. Hooper, E. Glucksman, S. Jackson, and C. Swift. Prevention of Falls in the Elderly Trial (PROFET): A Randomized Controlled Trial. *THE LANCET* 353 (1999): 93–97.

[41] Cummings, R., M. Thomas, G. Szonyi, G. Salkeld, E. O'Neil, C. Westbury, and G. Frampton. Home Visits by an Occupational Therapist for Assessment and Modification of Environmental Hazards: A Randomized Trail of Falls Prevention." *Journal of the American Geriatrics Society* 47 (1999): 1397–1402.

however, there are forecasts of shortages of trained personnel and providers of a variety of assistive services. For example, a recent national study of U.S. adult day service providers found:

> The current number of adult day centers—3,407—falls far short of what is needed to serve the needs of the population of adults with chronic, debilitating illnesses and their family caregivers. The study estimates that the U.S. population base can support 8,520 adult day centers, with 5,415 more centers needed.[42]

It is possible that increased use of AT may help alleviate some personnel shortages by serving as a partial substitute for assistive services. However, empirical analyses of the potential for substitution have not shown clear results. Hoenig et al. found that use of assistive technologies was associated with fewer hours of personal assistance among community-dwelling persons age 65 and older.[43] But Agree and Freedman found that assistive technologies conferred no additional benefit in the three dimensions of residual difficulty they analyzed (pain, fatigue, and time intensity). Nevertheless, they also found that AT users reported fewer unmet needs for personal care.[44]

## *7.4 The Future of Assistive Technologies*

With the expected continuation of trends such as the miniaturization of microprocessors, the development of new lightweight, high-strength materials, and the reach of wireless communication, as well as the ability of new construction (and to some degree housing rehabilitation) to incorporate a range of developments in these areas and in universal design, we can expect continuing innovation in assistive technologies. We provide several examples in this section.

One type of technology currently under development might be called a mobile interactive assistant. A prototype example is a mobile robot, called "Pearl," which "has two primary functions: (i) reminding people about routine activities such as eating, drinking, taking medicine, and using the bathroom, and (ii) guiding them through their environments." To give a sense of the complexity of such technology, Pearl is:

> equipped with a differential drive system, two on-board…PCs, wireless Ethernet, …laser range finders, sonar sensors, microphones for speech recognition, speakers for speech synthesis, touch-sensitive graphical displays, actuated head units, and stereo camera systems.
>
> On the software side, Pearl features off-the-shelf autonomous mobile robot navigation systems, speech recognition and speech synthesis software, fast image capture and

[42] National Study of Adult Day Services. Grant Results Brief. The Robert Wood Johnson Foundation, last updated April 2004, at http://www.rwjf.org/reports/grr/037535.htm.
[43] Hoenig, Helen, Donald H. Taylor, and Frank A. Sloan. Does Assistive Technology Substitute for Personal Assistance Among the Disabled Elderly?, *American Journal of Public Health* 93(2) (2003): 330–337.
[44] Agree E. M., and V. A. Freedman. A Comparison of Assistive Technology and Personal Care in Alleviating Disability and Unmet Need. *Gerontologist* 43(3) (2003):335–344.

> compression software for online video streaming, and face detection and tracking software. Additionally, Pearl includes software modules…that support the primary tasks of providing reminders and assisting with navigation.[45]

Another area being explored by researchers in the United States and Japan is the use of "exoskeletons," especially for lower limbs, where some initial research has focused on applications where a person needs to carry heavy loads. One such device, which looks somewhat like a metal skeleton, is strapped to the boots and legs of the user. Computer-driven sensors detect the user's movement, and hydraulic actuators flex the device to carry its own weight as well as a payload of at least 70 pounds. The exoskeleton constantly calculates what it needs to do to distribute the weight so that little to no load is imposed on the user, although the user contributes to the balance. Said one researcher, "The fundamental technology developed here can also be developed to help people with limited muscle ability to walk optimally."[46]

A third example is tracking a person's location and activities in order to assist the person in maintaining his or her health and functioning and avoiding harm. One example is the technology used by Elite Care–Oatfield Estates, a residential care facility in Milwaukie, Oregon. This technology allows residents' families to obtain information in real time through a secure Internet connection, including a visual locater that shows where the resident is, a location history that shows where the resident was earlier, data from sensors in the resident's bed that can provide some indication of sleep patterns, and a location history for the resident's room that shows by name who was in the room and how long the person stayed. Facility managers can also access these data and can observe temperatures, whether doors are open or closed, and if fans and lights are on or off.[47]

Such tracking systems raise privacy issues that need to be carefully explored and resolved. Resolution of these issues seems feasible in a community-based setting in which the person to be monitored voluntarily installs the monitoring technology for his or her own peace of mind as the person continues to live independently. One small study found that older adults are willing to give up some privacy if this enables them to remain independent longer.[48] More institutional settings might require a more formal and detailed exploration of the several issues that can arise from such monitoring.

Overall, we found little current coverage for cognitive assistive technologies, designed, for example, to assist individuals in performing tasks at the appropriate time and in the proper fashion. One reason for this is that this is a relatively new type of AT, indeed, one that is still in

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[45] Pollack, Martha E., et al. Pearl: A Mobile Robotic Assistant for the Elderly." Undated, available at http://www-2.cs.cmu.edu/~nursebot/web/papers/umich/aaai02wkshp.pdf.

[46] Exoskeleton Helps with Heavy Loads, at http://bleex.me.berkeley.edu/bleex.htm, accessed 7/27/05; UC Berkeley Researchers Developing Robotic Exoskeleton that Can Enhance Human Strength and Endurance, at http://bleex.me.berkeley.edu/bleex.htm, accessed 7/27/05.

[47] Written testimony of Lydia Lundberg, owner, Elite Care–Oatfield Estates, presented to the U.S. Senate Special Committee on Aging hearing on Assistive Technology for Aging Populations, April 27, 2004.

[48] "Older Adults Will Accept Monitoring Technology to Live in Their Homes Longer." Georgia Institute of Technology Research News, May 6, 2004, available at http://www.eurekalert.org/pub_releases/2004-05/giot-oaw050604.php.

an early development phase. Nevertheless, over half of the people living in nursing homes have cognitive impairment, and recognition is increasing that many persons with such impairments can be accommodated in less institutional environments without as much medical infrastructure. But assistance is still needed, and assistive technologies to assist with cognitive impairments could play an important role in these types of residences.

## *7.5 Concluding Remarks*

Society is slowly expanding its approach to aging and disability beyond consideration of health and toward the broader concepts of functioning and independence. Technological innovations have allowed assistive technologies to play a growing role alongside assistive services, which remain integral to promoting functioning.

Functioning takes place within an individual's environment. And substantial progress has been made in making public buildings and spaces, the workplace, and travel and communication more accessible to persons with disabilities. Much of this progress has resulted from laws and regulations, rather than from programs that provide direct funding for assistive technologies.

But not nearly as much progress has been made in equipping people with the assistive technologies that allow them to take advantage of these improved public venues, nor with the personal technologies and/or housing modifications and designs that support people's ability to live independently in their own homes. As a result, the potential benefits of these technologies are not fully exploited, and the functioning and independence of persons with disabilities are not being maximized.

Some programs, such as vocational rehabilitation programs and the benefits available to some veterans, provide good support for assistive technologies. However, each of these programs covers only limited groups of persons with disabilities.

Health care programs appear at first glance to be logical funding sources for assistive technologies, but their coverage is in fact limited. In particular, the major government health care programs, Medicare and Medicaid, do a poor job of funding assistive technologies. Because they are medically oriented health programs, their focus is more on "medically necessary" care than on functioning per se. Medicaid, which has become the de facto provider of long-term care for lower-income persons with disabilities, is slowly trying to reorient its funding toward community-based care, largely through Section 1915(c) Home and Community-Based Services waivers. However, while these waivers are more likely to cover assistive technologies than are regular Medicaid state plans, the home and community-based services waivers are still more likely to cover assistive services than they are to cover assistive technologies.

Several other programs, both public and nonprofit, fund specific types of assistive technologies, but these programs are small. So while they might be expected to take up the slack of health care programs' meager coverage of assistive technologies, they do not have the financial capacity to do so. The net result of these several but limited funding options is that people pay out of their

own pockets for the largest portion of the costs of these technologies, which results in unmet need among those who cannot afford it.

As a result, society faces several important questions:

To what degree should there be more public funding of technologies that assist in functioning?

To what degree should additional public funding be accomplished through Medicare and Medicaid, which are primarily health care programs whose coverage determinations are currently based largely on considerations of medical necessity?

While these questions require a broad policy debate, we have some smaller suggestions:

Medicaid Section 1915(c) HCBS waivers should provide broader coverage of assistive technologies. There should be more flexibility in determining the best mix of assistive technologies and assistive services. These community-based waivers are an alternative to providing long-term care in an institution, where some assistive technologies are part of the building design and many others are readily available, and where there is a concentration of assistive personnel that may be difficult to duplicate in scattered community housing. It is sensible therefore to encourage greater latitude in waivers to find the cost-effective combination of services and technologies that best enables each individual to avoid institutionalization, given his or her individual needs and circumstances and the technologies and services available specifically to each individual.

More evaluation is needed of both the relative effectiveness and the cost-effectiveness of assistive technologies. In these times of scarce government dollars, it is more important than ever to conduct such analyses, which need to consider increased independence and improved quality of life as potential benefits.

More evaluation is needed to determine effective combinations of assistive technologies and assistive services. Assistive technologies and assistive services may serve as complements or substitutes, depending on the situation. Integrated decision making needs to be improved, especially where funding for assistive technologies and assistive services is spread across several programs.

# Appendix A: Coverage of Assistive Technologies under Medicaid Waivers for “Older Persons” or “Older Persons and Persons with Disabilities”

**Table A.1: Coverage of Assistive Technologies under Medicaid Waivers for Older Persons or for Older Persons and Persons with Disabilities**

| State/Program | Criteria and Covered AT* |
|---|---|
| Alabama:<br>Elderly and Disabled Waiver | 65+ years or disability<br>• No coverage of assistive technologies or home modifications |
| Alaska:<br>Older Alaskans Waiver | 65+ years<br>• Environmental accessibility modifications<br>• Specialized medical equipment[1] |
| Arkansas:<br>ElderChoices | 65+ years<br>• Personal emergency response system |
| California:<br>Disabled Frail Elderly Waiver/<br>Multipurpose Senior Services Program | 65+ years<br>• Environmental accessibility modifications<br>• Emergency response system |
| Colorado:<br>Elderly, Blind, and Disabled Waiver | 65+ years, blind, or disabled<br>• Environmental accessibility modifications<br>• Personal emergency response system |
| Connecticut:<br>Home Care Program for Elders | 65+ years<br>• Personal emergency response system<br>• Minor home modifications |
| Delaware:<br>Waiver for the Elderly and Disabled | 65+ years or 18+ years and disability<br>• Emergency response system<br>• Orthotics and prosthetics may be covered on a limited basis |
| District of Columbia:<br>Elderly and Disabled Waiver | 65+ years or 18 + years and disability<br>• Environmental accessibility modifications<br>• Personal emergency response system |
| Florida:<br>Aged and Disabled Adult Waiver<br><br><br><br>Channeling Waiver | 65+ years or 18 + years and disability<br>• Specialized medical equipment[1]<br>• Personal emergency response system<br>• Environmental accessibility modifications<br><br>65+ years<br>• Environmental accessibility modifications<br>• Personal emergency response system |
| Georgia:<br>Community Care Services Program | 65+ years or disability<br>• Personal emergency response system |
| Hawaii:<br>Nursing Home Without Walls Program | 65+ years or disability<br>• Environmental accessibility modifications<br>• Specialized medical equipment[1]<br>• Personal emergency response system |
| Idaho:<br>Waiver for Individuals Who are Elderly or Physically Disabled | 65 + years or 18+ years and disability<br>• Environmental accessibility modifications |

| | |
|---|---|
| | • Specialized medical equipment[1]<br>• Personal emergency response system |
| Illinois:<br>Waiver for the Elderly | 60+ years<br>• Personal emergency response system |
| Indiana:<br>Aged and Disabled Waiver | 65 + years or disability<br>• Environmental accessibility modifications<br>• Specialized medical equipment[1]<br>• Personal emergency response system |
| Iowa:<br>Elderly Waiver | 65+ years<br>• Assistive devices<br>• Home modifications<br>• Vehicle modifications<br>• Personal emergency response system<br>(Amended waiver may not cover assistive devices, home and vehicle modifications.) |
| Kansas:<br>Home and Community-Based Services for the Elderly | 65+ years<br>• Emergency response system<br>• Assistive technology |
| Kentucky:<br>Home Care Waiver Services | 65+ years, blind, or disabled<br>• Environmental accessibility modifications |
| Louisiana:<br>Elderly and Disabled Adult Waiver | 65+ years or 21+ years and disability<br>• Environmental accessibility modifications<br>• Personal emergency response system |
| Maine:<br>Home and Community Benefits for the Elderly | 65+ years or age 60–64 if MaineCare eligible because of blindness or disability<br>• Environmental accessibility modifications<br>• Personal emergency response system |
| Maryland:<br>Medicaid Waiver for Older Adults | 50+ years<br>• Personal emergency response system<br>• Home modifications and assessments<br>• Assistive devices |
| Massachusetts:<br>Aged and Disabled Waiver | 60+ years and disability<br>• Environmental accessibility modifications |
| Michigan:<br>Home and Community-Based Waiver | 18+ years and disability<br>• Home modifications<br>• Personal emergency response system<br>• Specialized medical equipment [1] |
| Minnesota:<br>Elderly Waiver | 65+ years<br>• Home modifications<br>• Personal transportation AT<br>• Personal AT for ADLs<br>• Personal AT for mobility |
| Mississippi:<br>Elderly and Disabled Waiver | 21+ years and disability<br>• No coverage for assistive devices or home |

| | |
|---|---|
| | modifications |
| Missouri:<br>Home and Community-Based Waiver for the Elderly and Disabled | 65+ years or disability<br>• No coverage for assistive devices or home modifications |
| Montana:<br>Home and Community-Based Services Program | 65+ years or disability<br>• Environmental accessibility adaptations<br>• Specialized medical equipment[1]<br>• Personal emergency response systems |
| Nebraska:<br>Aged and Disabled Waiver | 65+ years or disability<br>• Personal emergency response system<br>• Assistive technology (devices, controls, or appliances that increase ability to perform ADLs, or to perceive, control, or communicate with the home environment)<br>• Home modifications |
| Nevada | 65+ years<br>• Personal emergency response system |
| New Hampshire:<br>Home and Community-Based Care Program | 60+ years or 18+ years and chronically ill<br>• Environmental accessibility adaptations<br>• Assistive technology<br>• Specialized medical equipment[1]<br>• Personal emergency response system |
| New Jersey:<br>Community Care Program for the Elderly and Disabled<br><br>In-Home Components Caregiver Assistance Program | 65+ years or disability<br>• No equipment or environmental adaptation<br><br>65+ years or 21+ years and disability<br>• Specialized medical equipment[1]<br>• Personal emergency response system<br>• Environmental accessibility adaptations |
| New Mexico:<br>Disabled and Elderly Waiver | 65+ years or disability<br>• Home modifications<br>• Personal emergency response system |
| New York:<br>Long-Term Home Health Care Program | 65+ years or disability<br>• Personal emergency response system<br>• Housing improvements |
| North Carolina:<br>Community Alternatives Program for Disabled Adults | 65+ years or disability<br>• Personal emergency response system<br>• Home mobility aids: ramps, handrails, grab bars, handheld showers, nonskid surfaces, and widening of doorways |
| North Dakota:<br>Home and Community-Based Services waiver | 65+ years or disabled, capable of directing own care<br>• Emergency response system<br>• Environmental modifications |

| | |
|---|---|
| | • Specialized equipment to reduce need for human help |
| Ohio:<br>Ohio Home Care Waiver | Disability and unstable medical condition<br>• Emergency response system<br>• Home modifications<br>• Supplemental adaptive/assistive devices (devices or equipment not otherwise covered that increase the person's functional ability) |
| Oklahoma:<br>ADvantage Waiver | 65+ years or 18+ years and disability<br>• Environmental accessibility adaptations<br>• Specialized medical equipment[1] |
| Oregon | 65+ years or disability<br>• Environmental accessibility adaptations<br>• Personal emergency response system |
| Pennsylvania:<br>Pennsylvania Department of Aging Waiver<br><br>Long-Term Care Capitated Assistance Program–State | 60+ years<br>• Home modifications<br>• Personal emergency response system<br>• Specialized medical equipment[1]<br><br>60+ years, at home when first enroll<br>• Eyeglasses<br>• Specialized medical equipment[1]<br>• Environmental modifications |
| Rhode Island:<br>Aged and Disabled Waiver<br><br>Department of Elder Affairs Waiver | 65+ years or disability<br>• Minor assistive devices (i.e., grooming, cooking, and eating aids)<br>• Minor home modifications (ramp, grab bars, toilet modification)<br>• Personal emergency response system<br><br>65+ years<br>• Minor assistive devices<br>• Minor home modifications<br>• Personal emergency response system |
| South Carolina:<br>Elderly and Disabled Waiver | 18+ years and disabled<br>• Environmental modifications<br>• Personal emergency response system |
| South Dakota:<br>Home and Community-Based Waiver Services for the Elderly | 65+ years<br>• Specialized medical equipment[1]<br>• Personal emergency response system |
| Tennessee:<br>Statewide Home and Community-Based Waiver for the Elderly and Disabled | 21+ years and disability<br>• Personal emergency response system<br>• Minor home modifications |
| Texas: | 21+ years and disability |

| | |
|---|---|
| Community-Based Alternatives | • Personal emergency response system<br>• Adaptive aids (devices, controls, or medically necessary supplies that enable people with functional impairments to perform ADLs or control the environment in which they live)<br>• Minor home modifications |
| Utah:<br>Home and Community-Based Waiver | 65+ years<br>• Personal emergency response system |
| Vermont:<br>Home and Community-Based Waiver | 65+ years or 18+ years and disability<br>• Assistive devices<br>• Home modifications |
| Virginia:<br>Elderly and Disabled Waiver | 65+ years or disabled<br>• Personal emergency response system |
| Washington:<br>In-Home Services–COPES | At risk of nursing home placement within 30 days<br>• Environmental modifications<br>• Personal emergency response system<br>• Specialized medical equipment[1] |
| West Virginia:<br>Medicaid Waiver for Aged and Disabled | 18+ years and disability<br>• No coverage of assistive devices or home modifications |
| Wisconsin:<br>Community Options Program | Disability, but no age requirement<br>• Environmental accessibility modifications<br>• Personal emergency response system<br>• Adaptive aids (including cognitive aids)<br>• Communication aids<br>• Hearing aids |
| Wyoming:<br>Long-Term Care Home and Community-Based Waiver | 19+ years and disability<br>• Personal emergency response system |

* As described in the text, other eligibility criteria also apply.

[1]"Specialized medical equipment" is a term used to describe coverage of several Medicaid waivers that is ambiguous with regard to assistive technologies. Several states describe "specialized medical equipment and supplies" as including devices, controls, or appliances, specified in the plan of care, that enable individuals to increase their abilities to perform ADLs or to perceive, control, or communicate with the environment in which they live. This service also includes items necessary for life support, ancillary supplies and equipment necessary to the proper functioning of such items, and durable and nondurable medical equipment not available under the Medicaid state plan. Items reimbursed with waiver funds shall be in addition to any medical equipment and supplies furnished under the State plan and shall exclude those items that are not of direct medical or remedial benefit to the individual (from http://www.hss.state.ak.us/dsds/docs/HCBOA_waiver.pdf).

# Appendix B: Detailed Tables for Public and Private Program Funding of Assistive Technologies in Minnesota, Georgia, and New York

## TABLE B.1: Public and Private Program Funding of Assistive Technologies – MINNESOTA

| Name of Program | Type of Program[1] | Covered AT | Eligibility Criteria |
|---|---|---|---|
| **Government Programs** | | | |
| *Medicare* | Federal | -Personal mobility AT<br>-Prosthetics and orthotics | -AT must meet medical necessity criteria |
| *Supplemental Security Income Work Incentive: Plan for Achieving Self-Support (PASS)* | Federal<br>-SSI program to help individuals achieve specific work goals | -Hearing, vision & communication AT<br>-Personal AT for ADLs<br>-Computer access/ergonomics<br>-Transportation AT<br>-Personal mobility AT | -Blind or disabled<br>-Under age 65<br>-Meet eligibility requirements for SSI except for resources devoted to PASS<br>-Have a specific work objective or vocational goal (that will bring the person closer to self-sufficiency) that cannot be achieved without items or services that the person must pay for him or herself |
| *Supplemental Security Income Work Incentive: Impairment-Related Work Expense (IRWE)* | Federal | -Hearing, vision & communication AT<br>-Personal AT for ADLs<br>-Transportation AT<br>-Personal mobility AT<br>-Building modifications/design<br>-Job accommodations | -Must be needed to enable the person to work and be related specifically to the individual's disability<br>-Must be purchased directly by the beneficiary |
| *Veterans Benefits* | Federal | All types of AT devices | -Veterans Administration Medical Center determines eligibility status<br>-If service-connected disability, devices and services provided at no cost |
| *U.S. Department of Agriculture–(Section 504) Rural Home Repair Loan Program* | Federal<br>-Loans are at a fixed rate of 1%<br>-Maximum assistance to any person for initial or subsequent Section 504 loans may not exceed $20,000 | -Building modifications/design | -Capable of incurring loan obligation with adequate repayment ability<br>-Favorable credit history<br>-Unable to use personal resources for repair or obtain needed credit elsewhere<br>-Owner & occupant of the dwelling to be repaired<br>-Have an adjusted annual income that does not exceed the "very low income" limit as set by USDA Rural Development |

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| *U.S. Department of Agriculture–(Section 504) Rural Home Repair Grant Program* | Federal<br>-Lifetime assistance to any individual for initial or subsequent 504 grants may not exceed a cumulative total of $7,500 | -Building modifications/design | -Persons age 62 and older who cannot afford to repay a loan |
| *U.S. Department of Agriculture–(Section 502) Single Family Housing Direct Loan Program* | Federal<br>-Loans are typically made for up to 33 years | -Building modifications/design | -Very low or low incomes<br>-Able to afford mortgage payments, including taxes and insurance<br>-Without adequate housing and unable to obtain credit elsewhere, yet have acceptable credit history |
| *U.S. Department of Agriculture–Rural Housing Guaranteed Loan Program* | Federal<br>-Loans are made for up to 30 years | -Building modifications/design | -Able to afford mortgage payments, including taxes and insurance<br>-Without adequate housing and unable to obtain credit elsewhere, yet have acceptable credit history<br>- Must meet income eligibility criteria |
| *Medicaid-Medical Assistance Program (State Plan and Waiver Programs)* | Federal/state | -Personal AT for ADLs<br>-Hearing, vision & communication AT<br>-Personal mobility AT<br>-Prosthetics and orthotics<br>-Transportation AT | -Means tested for persons who are aged, blind, and disabled; or members of families with dependent children; and for persons with large medical care costs who are “medically needy” |
| *Consumer Support Grant Program–Minnesota Department of Human Services* | State<br>-An alternative use of the state-funded portion of Medicaid-reimbursed home care; participants receive monthly cash grants and, with county assistance, manage and pay for home and community-based services, including modifications and equipment | -Personal AT for ADLs<br>-Hearing, vision & communication AT<br>-Computer access/ergonomics Education/employment<br>-Building modifications/design<br>-Personal AT for mobility<br>-Prosthetics and orthotics<br>-Transportation AT | -Recipient of or eligible for medical assistance (Medicaid)<br>-Have functional limitations requiring ongoing supports to live in the community and live in a home setting<br>-Cannot concurrently receive coverage through the state’s managed care program or a Home and Community-Based Service Waiver |
| *General Assistance Medical Care (GAMC) Program* | State<br>-Health care program for low-income individuals who do not qualify for the Medicaid<br>-Funds both services and assistive technologies | -Personal AT for ADLs<br>-Hearing, vision & communication AT<br>- Personal mobility AT<br>-Prosthetics and orthotics<br>-Transportation AT | -Primarily low-income individuals, individuals with disabilities, or individuals with many medical needs, though criteria vary |

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| *MinnesotaCare Program* | State- and partially federal-funded health program for Minnesotans who meet program guidelines | -Personal AT for ADLs<br>-Hearing, vision & communication AT<br>-Personal mobility AT<br>-Prosthetics and orthotics<br>-Transportation AT | -Primarily low-income individuals, individuals with disabilities, or individuals with many medical needs, though criteria vary<br>-Ineligible for other specified health coverage |
| *Minnesota Housing Finance Agency* | State<br>-Agency works with local lenders and community housing agencies to provide low-interest loans to:<br>-make homes more accessible for persons with disabilities<br>-make homes more energy efficient<br>-make repairs and modifications to the home | -Building modifications/design | -Meet household income guidelines<br>-Income limits are waived where the improvements are exclusively accessibility improvements<br>-Property must be year-round, owner-occupied home<br>-Borrower must be a reasonable credit risk |
| *Minnesota State Services for the Blind* | State | -Personal AT for ADLs<br>-Vision & communication AT<br>-Computer access/ergonomics<br>-Education/employment | -Varies, depending on the program |
| *Minnesota Rehabilitation Services Vocational Rehabilitation (VR) Program/ Independent Living (IL) Program/Extended Employment* | State | -Personal AT for ADLs<br>-Hearing, vision & communication AT<br>-Computer access/ergonomics<br>-Education/employment<br>-Building modifications/design<br>-Personal AT for mobility<br>-Prosthetics and orthotics<br>-Transportation AT | -In VR, eligibility is based on having a disability that creates substantial impediments to employment and needing VR services to prepare, secure, or regain employment<br><br>-In IL, eligibility is based on having a disability and a need to become more independent |
| *Alternative Care Program Minnesota Department of Human Services* | State | -Personal AT for ADLs<br>-Hearing & communication AT<br>-Building modifications/design<br>-Personal mobility AT | -Over age 65<br>-Require nursing facility level of care but choose to remain in the community<br>-Inadequate income and assets to fund a nursing facility stay of more than 180 days<br>-No other funding source available for community services |
| *Telephone Equipment Distribution Program* | State<br>-Funded by a telephone surcharge on all private telephone lines | -Hearing & communication technologies | -Income test<br>-Communication impaired or has a mobility impairment that significantly impedes ability to access standard telephone equipment |

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| ***S**ystem of **T**echnology to **A**chieve **R**esults (STAR)* | State<br>-Funded by the federal Assistive Technology Act<br>-Informs Minnesotans about assistive technologies, works with state agencies, and maintains community collaborative and communication efforts | | |
| *New York State Workers' Compensation Board* | State | Assistive devices may be provided through contact with worker's compensation insurance companies, health providers, and agencies that offer these services | -Job-related disability with an impact on an individual's ability to return to work or to perform ADLs |
| **Nongovernment Programs** | | | |
| *Assistive Technology of Minnesota (ATMN)* | Nonprofit<br>-Provides microloan program to aid persons, families, or employers to purchase and receive training on assistive technologies | -Personal AT for ADLs<br>-Personal mobility AT<br>-Computer Access/Ergonomics<br>-Hearing, vision & communication technologies<br>-Building modification/design<br>-Prosthetics and orthotics<br>-Transportation AT | -Demonstrate the ability to repay the loan to the local bank; lending institution makes the final decision on each loan application |
| *Association of Blind Citizens: Assistive Technology Fund* | Nonprofit<br>-Provides funds to cover 50% of the retail price of adaptive devices or software<br>-Products must have a retail price of $200–$6,000 | -Vision AT | -Legally blind<br>-U.S. resident<br>-Income and asset tests |
| *Automobile Adaptation Programs (DaimlerChrysler, Ford, General Motors)* | Private sector<br>-Maximum amount individual can receive: $1,000 | -Transportation AT | -Driver or a household member must have a physical disability<br>-Other eligibility criteria may apply |
| *Catholic Charities Office of Persons with Disabilities: The Ramp Project* | Nonprofit<br>-Funded by a grant from the United Way | -Personal AT for ADLs<br>-Building modification/ design | -Live in the Greater Metropolitan United Way Service Area (Minneapolis/St. Paul)<br>-Person with a physical disability or older person at or below poverty level or on fixed income unable to leave their homes due to physical limitations or architectural barriers |

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| *Goodwill/Easter Seals of Minnesota Equipment Loan Program (4 locations)* | Nonprofit<br>-Provides loans of durable equipment (for up to 6 months) or information on procuring equipment and home modifications | -Personal AT for ADLs<br>-Education/employment<br>-Personal mobility AT | -All ages<br>-Must provide medical documentation of need for equipment |
| *Hearing Foundation's Hear Now* | Nonprofit | Hearing AT | -All ages<br>-Hearing impairment<br>-Income test |
| *Lions Club* | Nonprofit | Vision AT (eyeglasses) | -Financial hardship |
| *Mark's Computer Program* | Nonprofit | Computer access/ergonomics | -Must have a disability |
| *The Minnesota Assistive Technology Loan Network (a program of United Cerebral Palsy of Minnesota)* | Nonprofit<br>-Loan (for trial) communication equipment to consumers and their AT professionals before purchase | -Augmentative and alternative communication AT | -Any communication disorder |
| *Mobility for Independence (formerly the Leo Grossman Fund)* | Nonprofit<br>-Will match funds and assist individuals to conduct fund raising for their portion | -Personal mobility AT<br>-Transportation AT | -Based on need<br>-Must submit a proposal for approval by the governing board |
| *Multiple Sclerosis Society-Minnesota Chapter* | Nonprofit<br>-Subsidies for equipment are available after all other third-party payments have been made | -Personal AT for ADLS<br>-Building modifications/design<br>-Personal mobility AT<br>-Prosthetics and orthotics<br>-Transportation AT<br>-Vision | -Registered member of the Minnesota Chapter of the MS Society |
| *National Federation of the Blind (NFB): Low-Interest Loan Program* | Nonprofit<br>-Established to assist blind individuals in acquiring computers and related equipment through low-interest loans | -Computer access/ergonomics<br>-Vision | -Blind<br>-Income test<br>-Unable to obtain other loans |
| *Options Resource Center for Independent Living* | Nonprofit<br>-Individuals may lease adaptive equipment from Options at no charge for up to 3 months | -Personal AT for ADLs<br>-Personal mobility AT | -Person with a disability or a family member of a person with a disability. |

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| *Pearle Vision Foundation* | Nonprofit<br>-Grants awarded to individuals for low-vision equipment (a limited program) | -Vision AT | -All ages<br>-Sensory limitations (vision, hearing)<br>-Financial hardship and in need of vision care<br>-Must be sponsored by a second party, such as an eye care professional, member of the clergy, or social worker; an attending physician must complete a "Physician's Statement" |
| *People Achieving Change Through Technology (PACTT) Equipment Loan Program* | Nonprofit<br>-Equipment loan library | -Personal AT for ADLs<br>-Computer access/ergonomics<br>-Communication | -Paid for in part by user fees |
| *United Cerebral Palsy of Central Minnesota, Inc.* | Nonprofit | -Personal AT for ADLs<br>-Personal mobility AT<br>-Computer access/ergonomics<br>-Communication<br>-Prosthetics and orthotics | -Reside in the 3-county area<br>-To receive financial assistance to purchase equipment, a person must have a diagnosis of cerebral palsy<br>-To qualify for a used computer, a person must have a disability |

Note: Much of this information comes from the Minnesota STAR Program Web site (http://www.mnplan.state.mn.us/star/index.html).
[1]Many of these programs also fund *assistive* services, and, in some cases, assistive technologies may not be a primary focus of the program.

## TABLE B.2: Public and Private Program Funding of Assistive Technologies – GEORGIA

| Name of Program | Type of Program[1] | Covered AT | Eligibility Criteria |
|---|---|---|---|
| **Government Programs** | | | |
| *Medicare* | Federal | -Personal mobility AT<br>-Prosthetics and orthotics | -AT must meet medical necessity criteria |
| *Supplemental Security Income Incentive: Plan For Achieving Self-Support(PASS)* | Federal<br>-SSI program to help individuals achieve specific work goals | -Hearing, vision & communication<br>-Personal AT for ADLs<br>-Computer Access/ergonomics<br>-Transportation AT<br>-Personal mobility AT | -Blind or disabled<br>-Under age 65<br>-Meet eligibility requirements for SSI except for resources devoted to PASS<br>-Have a specific vocational goal (that will bring the person closer to self-sufficiency) that cannot be achieved without the items or services |
| *Supplemental Security Income Work Incentive: Impairment-Related Work Expense (IRWE)* | Federal | -Hearing, vision & communication<br>-Personal AT for ADLs<br>-Transportation AT<br>-Personal mobility AT<br>-Building modifications/design<br>-Job accommodations | -AT must be needed to enable the person to work and be related specifically to the individual's disability<br>-Must be purchased directly by the beneficiary |
| *Veterans Benefits* | Federal | All types of AT devices | -Veterans Administration Medical Center determines eligibility status<br>-If service-connected disability, devices and services provided at no cost |
| *Job Training Partnership Act (JTPA)* | Federal | -Job accommodations | -Working (22–64 years)<br>-Communication limitations, learning limitations, motor limitations, personal care limitations, sensory limitations<br>-Most applicants must be economically disadvantaged |
| *U.S. Department of Agriculture–(Section 504) Rural Home Repair Loan Program* | Federal<br>-Loans are at a fixed rate of 1%<br>-Maximum assistance to any person for all Section 504 loans may not exceed $20,000 | -Building modifications/design | -Capable of incurring loan obligation with adequate repayment ability<br>-Favorable credit history<br>-Unable to use personal resources for repair or to obtain needed credit elsewhere<br>-Owner & occupant of dwelling to be repaired<br>-Have an adjusted annual income that does not exceed the "very low income" limit as set by USDA Rural Development |

| | | | |
|---|---|---|---|
| *U.S. Department of Agriculture–(Section 504) Rural Home Repair Grant Program* | Federal<br>-Lifetime assistance to any individual for 504 grants may not exceed $7,500. | -Building modifications/design | -Only available for people age 62 and older who cannot afford to repay a loan |
| *U.S. Department of Agriculture–(Section 502) Single Family Housing Direct Loan Program* | Federal<br>-Loans are typically made for up to 33 years | -Building modifications/design | -Have very low or low incomes<br>-Able to afford mortgage payments, including taxes and insurance<br>-Without adequate housing and unable to obtain credit elsewhere, yet have acceptable credit history |
| *U.S. Department of Agriculture–Rural Housing Guaranteed Loan Program* | Federal<br>-Loans are made for up to 30 years | -Building modifications/design | -Must be able to afford mortgage payments, including taxes and insurance<br>-Must be without adequate housing and be unable to obtain credit elsewhere, yet have acceptable credit history<br>-Must meet income eligibility criteria |
| *Medicaid (State Plan and Waiver Programs)* | Federal/state | -Personal AT for ADLs<br>-Hearing, vision & communication<br>-Personal mobility AT<br>-Prosthetics and orthotics<br>-Transportation AT | -Means tested for persons who are aged, blind, disabled or members of families with dependent children, and for persons with large medical care costs who are "medically needy" |
| *Georgia Department of Labor-Rehabilitation Services* | State (with substantial federal funding)<br>-Includes vocational rehabilitation and other programs | All types of AT devices | -Working (ages 22–64); school (age 6–21); seniors (65+ years)<br>-Communication limitations, learning limitations, motor limitations, personal care limitations, sensory limitations<br>-Have a physical or mental impairment that constitutes or results in a substantial barrier to employment and can benefit from VR services<br>-Financial criteria for some services |
| *Georgia Tele-communication Equipment Distribution Program* | State<br>-Lends equipment to individuals who are deaf, hearing impaired, or speech impaired to use a telephone in their home | -Hearing<br>-Communication | -Annual income must not exceed 200% of federal poverty level<br>-Must provide a certificate of need form signed by a qualified medical professional<br>-Must show proof of phone service without delinquent bills |
| *Tools for Life - Assistive Technology Resource Centers* | State<br>-Primarily works through equipment loans and exchanges and financial loans | -Communication<br>-Job accommodations<br>-Computer access<br>-Personal AT for ADLs<br>-Educational aids | -Communication limitations, learning limitations, motor limitations, personal care limitations, sensory limitations |

| | | | |
|---|---|---|---|
| *Georgia Worker's Compensation Board* | State | Assistive devices may be provided through contact with worker's compensation insurance companies, health providers, and agencies that offer these services | -Job-related disability with an impact on an individual's ability to return to work or to perform ADLs |
| **Nongovernment Programs** | | | |
| *Access Hall County, Inc.* | Nonprofit<br>-Gives devices free of charge, though supply depends on amount of donated equipment | -Communication<br>-Personal mobility AT | -Northern GA/Atlanta<br>-Communication limitations, learning limitations, motor limitations; personal care limitations, sensory limitations |
| *Association of Blind Citizens: Assistive Technology Fund* | Nonprofit<br>-Provides funds to cover 50% of the price of adaptive devices or software<br>Products must cost $200–$6,000. | -Vision AT | -Legally blind<br>-U.S. resident<br>-Income and asset tests |
| *Auto Programs (DaimlerChrysler, Ford & General Motors)* | Private sector | -Transportation AT | -Driver or a household member must have a physical disability<br>-Other eligibility criteria may apply<br>-Maximum amount individual can receive is $1,000 |
| *Barrier Free Gwinnett, Inc.* | Nonprofit | -Personal AT for ADLs<br>-Building modifications/design<br>-Job accommodations<br>-Recreational Aids<br>-Vision<br>-Personal mobility AT | -North GA/Atlanta<br>-Communication limitations, learning limitations, motor limitations; personal care limitations, sensory limitations |
| *Brunswick Citizens for Disability Empowerment* | Nonprofit | -Building modifications/design<br>-Job accommodations<br>-Personal mobility AT | -Coastal GA<br>-Communication limitations, learning limitations, motor limitations, personal care limitations, sensory limitations |
| *Centers for Independent Living (7 centers throughout state)* | Nonprofit | -All types of AT devices | -All ages<br>-Communication limitations; learning limitations; motor limitations; personal care limitations; sensory limitations |

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| *Easter Seals of North Georgia* | Nonprofit | -Communication<br>-Job accommodations | -North GA/Atlanta<br>-All Ages<br>-Communication limitations, learning limitations, motor limitations, personal care limitations, sensory limitations |
| *Easter Seals of East Georgia Equipment Loan Program* | Nonprofit<br>-Provides the opportunity to borrow, for as long as needed, non-fitted medical equipment that is in stock | -Personal AT for ADLs<br>-Personal mobility AT | -Physician's prescription is required<br>-Nominal one-time fee |
| *Habitat for Humanity International* | Nonprofit | Building modifications/design | -Working persons (age 22–64); seniors (65+ years)<br>-Communication limitations, learning limitations, motor limitations, personal care limitations, sensory limitations |
| *Hearing Foundation's Hear Now* | Nonprofit | Hearing AT | -All ages<br>-Hearing impairment<br>-Income test |
| *Lions Club* | Nonprofit | Vision (eyeglasses) and Hearing (hearing aids) AT | Financial hardship |
| *Muscular Dystrophy Association-Georgia Chapter* | Nonprofit<br>-Pays $2000 toward purchase of either wheelchair or leg brace<br>-Pays $2000 toward purchase of an augmentative communication device. | -Personal mobility AT (i.e., wheelchairs)<br>-Prosthetics & orthotics (i.e., leg brace)<br>-Communication | -All ages<br>-Motor limitations, personal care limitations<br>-Client must be registered with MDA and be diagnosed with one of the 40 neuromuscular diseases covered by the Association |
| *Multiple Sclerosis Society-Georgia Chapter* | Nonprofit | -Personal AT for ADLs<br>-Educational aids<br>-Building modifications/design<br>-Job accommodations<br>-Personal mobility AT | -All ages<br>-Motor limitations, personal care limitations |
| *Pearle Vision Foundation* | Nonprofit<br>-Grants awarded to individuals for low-vision equipment (limited program) | Vision | -All ages<br>-Sensory limitations (vision, hearing)<br>-Financial hardship and in need of vision care<br>-Must be sponsored by a second party such as an eye care professional, member of the clergy, or social worker; an attending physician must complete a "Physician's Statement" |
| *Reboot* | Nonprofit<br>-Recycles computers | Communication | -All ages<br>-Communication limitations, learning limitations, motor limitations, personal care limitations, sensory limitations |

Note: Much of this information comes from the “Dollars and Sense Funding Guide” located on the Georgia Tools for Life Web site (http://www.gatfl.org/ds/default.htm).

[1]Many of these programs also fund *assistive* services, and, in some cases, assistive technologies may not be a primary focus of the program.

## TABLE B.3: Public and Private Program Funding of Assistive Technologies—NEW YORK

| Name of Program | Type of Program[1] | Covered AT | Eligibility Criteria |
|---|---|---|---|
| **Government Programs** | | | |
| *Medicare* | Federal | -Personal mobility AT<br>-Prosthetics and orthotics | -AT must meet medical necessity criteria. |
| *Supplemental Security Income Incentive: Plans for Achieving Self-Support (PASS)* | Federal<br>-SSI program to help individuals achieve specific work goals | -Hearing, vision & communication AT<br>-Personal AT for ADLs<br>-Computer Access/ergonomics<br>-Transportation AT<br>-Personal mobility AT | -Blind or disabled<br>-Under age 65<br>-Meet eligibility requirements for SSI except for resources devoted to PASS<br>-Have a specific work objective or vocational goal (that will bring the person closer to self-sufficiency) that cannot be achieved without items or services that the person must pay for him or herself |
| *Supplemental Security Income Work Incentive: Impairment-Related Work Expense (IRWE)* | Federal | -Hearing, vision & communication AT<br>-Personal AT for ADLs<br>-Transportation AT<br>-Personal mobility AT<br>-Building modifications/design<br>-Job accommodations | -AT needed to enable the person to work and related specifically to the individual's disability.<br>-Must be purchased directly by the beneficiary |
| *Veterans Benefits* | Federal | All types of AT devices | -Veterans Administration Medical Center determines eligibility status<br>-If service-connected disability, devices and services provided at no cost |
| *U.S. Department of Agriculture–(Section 504) Rural Home Repair Loan Program* | Federal<br>-Loans are at a fixed rate of 1%<br>-Maximum assistance to any person for initial or subsequent Section 504 loans may not exceed $20,000 | -Building modifications/design | -Capable of incurring loan obligation with adequate repayment ability and favorable credit history<br>-Unable to use personal resources for repair or to obtain needed credit elsewhere<br>-Owner & occupant of the dwelling to be repaired<br>-Have an adjusted annual income that does not exceed the "very low income" limit as set by USDA Rural Development |
| *U.S. Department of Agriculture–(Section 504) Rural Home Repair Grant Program* | Federal<br>-Lifetime assistance to any individual for 504 grants may not exceed a cumulative total of $7,500 | -Building modifications/design | -Only available for people age 62 and older who cannot afford to repay a loan |

| | | | |
|---|---|---|---|
| *U.S. Department of Agriculture–(Section 502) Single Family Housing Direct Loan Program* | Federal<br>-Loans are typically made for up to 33 years | -Building modifications/design | -Very low or low incomes<br>-Able to afford mortgage payments, including taxes and insurance<br>-Without adequate housing and unable to obtain credit elsewhere, yet have acceptable credit history |
| *U.S. Department of Agriculture–Rural Housing Guaranteed Loan Program* | Federal<br>-Loans are made for up to 30 years | -Building modifications/design | -Able to afford mortgage payments, including taxes and insurance<br>-Without adequate housing and unable to obtain credit elsewhere, yet have acceptable credit history<br>- Meet income eligibility criteria |
| *Medicaid (State Plan and Waiver Programs)* | Federal/state | -Personal AT for ADLs<br>-Hearing, vision & communication AT<br>-Personal mobility AT<br>-Prosthetics and orthotics<br>-Transportation AT | -Means tested for persons who are aged, blind, disabled, or members of families with dependent children, and for persons with large medical care costs who are "medically needy" |
| *Family Health Plus* | State | -Durable medical equipment<br>-Prosthetics & orthotics | -Adults ages 19–64<br>-Medically necessary<br>-Low-income, but cannot be Medicaid eligible; must be uninsured<br>-No disability requirements |
| *Vocational & Educational Services for Individuals with Disabilities* | State | -AT that helps to secure, retain, or regain employment | -Must be of legal employment age<br>-No cost for assessment, counseling, and placement services, but may require individual to contribute to pay cost of other services<br>-Have a disability and functional limitation that may prevent employment without vocational rehabilitation intervention |
| *Commission for the Blind and Visually Handicapped–Equipment Loan Program* | State<br>-NY State lends a minimum of $500 and a maximum of $4000, but repayment must occur in 2–8 years (depending on amount lent) | -Devices can be used for medical use, aids to daily living, home or environmental modifications, orthotics, prostheses, etc. | -No age limitations<br>-Ineligible for other public programs<br>-Have a disability as defined by Section 292 of NY State Law<br>-Device must allow person to overcome barriers associated with a disability in daily living or vocational functioning following rehabilitation |
| *Commission for the Blind and Visually Handicapped–Contract with Adaptive Technology Centers* | State | -Vision AT | -Legally blind |

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|---|---|---|---|
| *Commission for the Blind and Visually Handicapped–Home and Vehicle Modification Program* | State | -Home modifications<br>-Transportation AT | -Legally blind |
| *Family Support Services (Office of Mental Retardation & Developmental Disabilities)* | State | -Home modifications and adaptive equipment (e.g., wheelchair ramps, handrails, communication boards) that enable people with physical disabilities or limited communication to lead more independent lives | -All ages<br>-No income restrictions<br>-Must be related to caring for a family member with a developmental disability<br>-Not covered by another funding source |
| *New York State Worker's Compensation Board* | State | -Assistive devices may be provided through contact with worker's compensation insurance companies, health providers, and agencies that offer these services | -Job-related disability with an impact on an individual's ability to return to work or to perform ADLs |
| *Technology-Related Assistance for Individuals with Disabilities (incl. Regional Assistive Tech Centers)* | State<br>-Includes TRAID-IN Equipment Exchange Program, which connects individuals with disabilities, who are searching for affordable devices, with people who have devices they wish to sell or donate | | |
| **Nongovernment Programs** | | | |
| *Association of Blind Citizens: Assistive Technology Fund* | Nonprofit<br>-Provides funds to cover 50% of the price of adaptive devices or software; products must have a retail price of $200–$6,000 | Vision AT | -Legally blind<br>-U.S. resident<br>-Income and asset tests |
| *Automobile Adaptation Programs (Daimler/Chrysler, Ford, General Motors)* | Private sector<br>-Maximum amount individual can receive: $1,000 | -Transportation AT | -Driver or a household member must have a physical disability<br>-Other eligibility criteria may apply |

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|---|---|---|---|
| *Hearing Foundation's Hear Now* | Nonprofit | -Hearing AT | -All ages<br>-Hearing impairment<br>-Income test |
| *Lions Club* | Nonprofit | -Vision (eyeglasses) and hearing (hearing aids) AT | -Financial hardship |
| *Multiple Sclerosis Society-New York Chapter* | Nonprofit<br>-Equipment loan, purchase subsidies, and repair | -Personal AT for ADLS<br>-Building modifications/design<br>-Personal mobility AT<br>-Prosthetics and orthotics<br>-Transportation AT<br>-Vision | -After all other third-party payments have been made<br>-Physician therapist referral is required |
| *Muscular Dystrophy Association-Buffalo* | Nonprofit | -Communication | -Diagnosed with one of the 43 neuromuscular diseases registered with MDA (then eligible for up to $2,000 toward one-time purchase of a communication device) |
| *Cerebral Palsy Associations of New York State (22 local Cerebral Palsy affiliates)* | Nonprofit<br>-UCP provides equipment loans and exchange<br>-Environmental modifications | -Various types of AT<br>-Home modifications/design (range of covered AT varies by affiliate) | -Applicant must have cerebral palsy or similar physical disability |

Note: Much of this information comes from *A Resource Guide: Assistive Technology Funding in New York State*, provided by the New York State Office of Advocate for Persons with Disabilities.

[1]Many of these programs also fund *assistive* services, and, in some cases, assistive technologies may not be a primary focus of the program.

## TABLE B.4: Expenditures and Persons Served for Selected State and Nonprofit Programs

| Name of Program | Type of Program and Covered AT[1] | Program Focused on AT? | Scope of Spending Data | Number of Persons | Expenditures |
|---|---|---|---|---|---|
| *Hearing Foundation's Hear Now* | Nonprofit—hearing AT | Yes | United States | Approved 7,566 hearing aids for 4,509 low-income children and adults (2003) | $1 million (2003) |
| *Consumer Support Grant Program* | State—an alternative use of the state-funded portion of Medicaid-reimbursed home care; covers most types of AT | No | Minnesota | 335 (2003) | $4 million (2003) |
| *Minnesota Housing Finance Agency* | State—agency works with local lenders and community housing agencies to provide low-interest loans to make homes more accessible, more energy efficient, and to make general repairs and modifications. | No | Minnesota | Total loans of $36.8 million to 2,991 homeowners. Of this total, there were loans of $161,655 to 21 owners for improvements to increase accessibility to a disabled occupant. Five of these 21 owners were age 62 or older and made accessibility improvements in the amount of $15,648 (2003). | |
| *Alternative Care Program* | State—for persons over age 65 who require nursing facility level of care but choose to remain in the community; covers most types of AT | No | Minnesota | 12,193 (2002) | $65 million for *all* services & AT (2002) |
| *Telephone Equipment Distribution Program* | State—hearing & communication technologies | Yes | Minnesota | 1,990 (2003) | $352,492 (2003) |
| *Goodwill/Easter Seals of Minnesota Equipment Loan Program (4 locations)* | Nonprofit—provides loans of durable equipment (for up to 6 months), or information on procuring personal AT for ADLs, education/employment AT, personal mobility AT, and home modification consultation | Yes | Minnesota | Served approx. 6,400 people, providing 9,400 loans of equipment for all 4 locations (2003) | Avg. cost per customer: $35.16 Avg. cost per piece of equipment: $25.11 (2003) |
| *Mark's Computer Program* | Nonprofit—computer access/ergonomics | Yes | Minnesota | 48 (2003) | Unavailable |
| *Multiple Sclerosis Society-Minnesota Chapter* | Nonprofit—provides subsidies for equipment; covers most types of AT | Yes | Minnesota | 452 (2003) | $241,735 (2003) |

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|---|---|---|---|---|---|
| *Muscular Dystrophy Association-Georgia Chapter* | Nonprofit<br>-Pays $2000 toward purchase of either wheelchair or leg brace<br>-Pays $2000 toward purchase of an augmentative communication device | No | Georgia | ~40–45 wheelchairs<br>~5 augmentative communication devices<br>(2003) | Unavailable |
| *Family Health Plus* | State—durable medical equipment and prosthetics and orthotics | No | New York | 397,268<br>(2003) | Unavailable |
| *Commission for the Blind and Visually Handicapped–Equipment Loan Program* | State—device must allow person to overcome barriers associated with a disability in daily living or vocational functioning following rehabilitation; covers most types of AT | Yes | New York | 4 loans for home modification<br>5 loans for computer equipment<br>(2003) | $7,682 for home modification<br>$9,088 for computer equipment (2003) |
| *Commission for the Blind and Visually Handicapped–Contract with Adaptive Technology Centers* | State—vision AT | Yes | New York | 221 received AT training & devices<br>(2003) | $1.5 million<br>(2003) |
| *Commission for the Blind and Visually Handicapped–Home and Vehicle Modification Program* | State—home modifications and transportation AT | Yes | New York | 3 home modifications<br>(2003) | $40,128 for home modifications (2003) |

[1] In addition to funding assistive technologies to the extent indicated, most programs fund assistive services.

Note: Much of this information comes from:

- the Minnesota STAR Program Web site (http://www.mnplan.state.mn.us/star/index.html);
- the "Dollars and Sense Funding Guide" located on the Georgia Tools for Life Web site (http://www.gatfl.org/ds/default.htm); and
- *A Resource Guide: Assistive Technology Funding in New York State*, provided by the New York State Office of Advocate for Persons with Disabilities.

# Appendix C: Government Regulations that Support Assistive Technologies

This appendix provides further detail on the regulations that support assistive technologies that were described briefly in section 4.6.

## C.1 The Americans with Disabilities Act of 1990[49]

The Americans with Disabilities Act (ADA) was enacted to protect the civil rights of people with disabilities. According to the ADA, the term, "disability," is defined as "a physical or mental impairment that substantially limits one or more of the major life activities of [an] individual, a record of such an impairment; or being regarded as having such an impairment." One provision of the law is that architectural barriers must be removed if this is "readily achievable," which the ADA defines as "easily accomplishable and able to be carried out without much difficulty or expense. In determining whether an action is readily achievable, factors to be considered include: the nature and cost of the action needed under this Act; the overall financial resources of the facility or facilities involved in the action; the number of persons employed at such facility."

The ADA is made up of five titles, all of which have implications for the adoption and use of assistive technologies, particularly in the areas of universal design and modifications of buildings, public spaces, and public transportation. The first title describes a policy of nondiscrimination in the workplace and providing reasonable accommodations to employees with disabilities. Title II Section A mandates that state and local governments may not discriminate based on disability; public programs and services must be accessible; newly constructed state and local government buildings and alterations to existing government buildings must be accessible; and newly constructed or altered streets must have curb cuts. Title II Section B requires accessible Amtrak stations, accessible light rail and rapid rail main stations, accessible transit facilities by public places when carrying out new construction or alterations, accessible public buses and rail vehicles when newly acquired, and public bus and rail companies must provide comparable paratransit services to people with disabilities who meet certain criteria.

Title III mandates that public places such as malls, restaurants, hotels, parks, and theaters must have a policy of nondiscrimination; physical barriers in public places must be removed, or the service must be provided by alternate means; public places that are newly constructed or altered must be accessible; elevators are required in buildings over a specific size; private businesses that provide public transportation must purchase accessible buses and vehicles when buying new vehicles; and new over-the-road buses must be accessible.

Title IV requires telephone companies to provide telecommunications relay services 24 hours a day, and Title V instructs federal agencies on enforcing the previous titles. The ADA provides specific guidelines for accessibility regarding buildings, vehicles, trains, and other environments.

## C.2 The Telecommunications Act of 1996[50]

The broad goals of the Telecommunications Act are to make the communications services business more competitive, of higher quality, and less expensive. Section 255 of the

[49] This section draws on information from http://www.access-board.gov/about/ADA%20Overview.htm.
[50] 47 U.S.C. §§ 255

Telecommunications Act addresses access for people with disabilities. In particular, Section 255 (b) states, "A manufacturer of telecommunications equipment or customer premises equipment shall ensure that the equipment is designed, developed, and fabricated to be accessible to and usable by individuals with disabilities, if readily achievable." Section 255 (c) states, "A provider of telecommunications service shall ensure that the service is accessible to and usable by individuals with disabilities, if readily achievable." Section 255 (d) states, "Whenever the requirements of subsections (b) and (c) are not readily achievable, such a manufacturer or provider shall ensure that the equipment or service is compatible with existing peripheral devices or specialized customer premises equipment commonly used by individuals with disabilities to achieve access, if readily achievable."[51] The Telecommunications Act uses the Americans with Disabilities Act definitions of "disability" and "readily achievable."

## *C.3 The Architectural Barriers Act of 1968*[52]

The Architectural Barriers Act was enacted to ensure access to buildings that were "designed, built, altered, or leased with Federal funds." In sections 4152 to 4154a, the Architectural Barriers Act states that the Administrator of General Services, the Secretary of Housing and Urban Development, the Secretary of Defense, or the United States Postal Service "in consultation with the Secretary of Health and Human Services, shall prescribe standards for the design, construction, and alteration of buildings…to insure whenever possible that physically handicapped persons will have ready access to, and use of, such buildings."[53] These ABA Accessibility Guidelines are formulated by the Access Board, a federal agency. Standards based on these guidelines replace the Uniform Federal Accessibility Standards (UFAS) and encompass parking lots, curb cuts, ramps, stairs, elevators, windows, doors, entrances, drinking fountains, bathrooms, storage, grab bars, alarms, signs, telephones, and other architectural and landscape features.[54]

## *C.4 The Air Carrier Access Act (ACAA) of 1986*

The Air Carrier Access Act (ACAA) was enacted to ensure that people with disabilities are not discriminated against when flying. As a result, both public and private airports must follow a number of regulations. Because of the ACAA and the ADA, airports must have accessible parking, restrooms, drinking fountains, travelers aid stations, ticketing systems, baggage check-in and retrieval, jetways, and telephones; signs that indicate the location of specific facilities; information systems using visual and auditory delivery systems; and a safe method of assisting a person with a disability onto and off of the airplane. Major airports must have shuttles and moving walkways to transport people inside the airport. An aircraft with 30 or more seats must have an aisle seat with a removable armrest for transferring from wheelchair to seat, and an aircraft with more than one aisle must have an accessible restroom.[55]

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[51] This section is largely derived from http://www.fcc.gov/Reports/tcom1996.pdf and http://www.access-board.gov/about/ADA%20Text.htm.

[52] Architectural Barriers Act of 1968, as amended by Pub. L. 90–480, 42 U.S.C. 4151 *et seq.*

[53] From http://www.access-board.gov/about/ABA.htm

[54] From http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.2

[55] From http://www2.faa.gov/acr/dat.htm

## *C.5 The Rehabilitation Act of 1973*

Several sections of the Rehabilitation Act involve technological mandates. Section 504, as amended (29 USC 794 and 24 CFR Parts 8 and 9), states that a person with a disability should not be excluded or discriminated against in any program or activity that receives federal funds or that is carried out by an executive agency or the United States Postal Service. Programs and activities include government programs and agencies, systems of higher education, local school systems, vocational education systems, and corporation and private organizations that receive government assistance or deal mainly in education, health care, housing, social services, or parks and recreation.

Section 508, as amended, states that federal employees with disabilities must have access and use of information and data that employees without disabilities are able to access and use, and that community members with disabilities who are seeking information and data from government agencies should have access to the same information and data as community members without disabilities.[56]

[56] From http://www.hp.ufl.edu/ot/aarp_at_project/images/Rehabilitation%20Act%20section%20508.doc.