U.S. Department of Health and Human Services
Assistant Secretary for Planning and Evaluation
Office of Disability, Aging and Long-Term Care Policy

# ASSISTIVE TECHNOLOGY FOR THE FRAIL ELDERLY:

## AN INTRODUCTION AND OVERVIEW

April 1992

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This report was prepared under contract between HHS's Office of Family, Community and Long-Term Care Policy (now DALTCP) and the University of Pennsylvania. For additional information about this subject, you can visit the DALTCP home page at http://aspe.hhs.gov/_/office_specific/daltcp.cfm or contact the office at HHS/ASPE/DALTCP, Room 424E, H.H. Humphrey Building, 200 Independence Avenue, S.W., Washington, D.C. 20201. The e-mail address is: webmaster.DALTCP@hhs.gov. The Project Officer was Robert Clark.

# ASSISTIVE TECHNOLOGY FOR THE FRAIL ELDERLY: An Introduction and Overview

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# I. INTRODUCTION

Long term care refers to a wide range of medical, social and personal care services needed by individuals who are functionally impaired. The elderly, persons aged 65 and over, are the primary users of long term care.

In 1985, there were about 5.5 million functionally disabled elderly living in the community and an additional 1.3 million in nursing homes. By the year 2020, each of these figures is projected to almost double to 10.1 million and 2.5 million respectively (Manton, 1989). Long term care has emerged as a significant health and social policy issue.

Long term care, particularly nursing home care, is expensive. In an era of large federal deficits, it consumes a large fraction of Medicare and Medicaid expenditures. The elderly, whether functionally impaired or not, prefer to live independently in their own homes for as long as possible. The problem is to find ways to control rising costs while enabling the frail elderly to live as independently as possible.

One promising solution is assistive technology.

# II. AN ALTERNATIVE TO HUMAN HELP

Long term care for the frail elderly has been provided predominantly by other people who help with daily activities such as preparing and eating meals, bathing, grooming and getting around. These aides often make the difference between an individual's ability to live at home in the community (with help) and the need to move to a more restrictive residential setting.

Due to the shrinking pool of direct service workers and the enlarging pool of elderly individuals who want to stay independent in the community, researchers, caregivers, family members and elderly individuals themselves are looking for new solutions. They are exploring strategies that reach beyond human assistance; they are looking closely at assistive technology.

"Assistive technology," according to the Technology Related Assistance Act of 1988 (P.L.100-407), is any item, piece of equipment, or set of products that helps a person with a disability to increase or improve his/her functional capabilities.

**Ida P. provides and example of how technological assistance can make the difference between dependence and functional independence. At age 85, Ida is energetic and sharp, but she is unable to walk more than a few steps due to increasingly severe arthritis. She is unable to go in nd out of her second floor apartment alone.**

**With intensive, daily human assistance, she can continue to live independently; she would need someone to shop and run other errands, and possibly to move her up and down the stairs. Alternatively, she can move to a facility where someone will prepare meals for her and staff will move her around.**

**A third option, assistive technology, in the form of a one time purchase of a wheelchair and a stair climbing seat, can make the difference between dependence and functional independence for Ida. To this vibrant member of the community, the choice is obvious.**

Assistive technology can allow a person with disabilities to function more independently, thus gaining self respect and greater acceptance in mainstream society. In addition, policymakers are becoming aware that assistive technology makes good fiscal sense. It has the potential to reduce the need for expensive human help and intensive informal care.

This paper offers an overview of assistive technology and P.L.100-407, and explores: (a) the potential of assistive technology to substitute for human assistance; (b) barriers to general acceptance of assistive technology; (c) advantages and disadvantages of assistive technology; (d) financing assistive technology; (e) research gaps; and (f) policy considerations concerning assistive technology.

# III. THE "TECH ACT" OF 1988

The field of assistive technology was given a significant push in 1988, both in terms of funding and public policy recognition.

Congress enacted the Technology Related Assistance Act of 1988 (P.L.100-407) to expand the availability of assistive technology services and devices to people with disabilities. The law, which was authorized for five years, contains two sections.

Title I authorizes the Secretary of Education to implement a program of grants to states to develop comprehensive statewide programs of technological assistance. Each state can receive between $500,000 and $1 million for the first two years. In the third year, the maximum amount rises to $1.5 million.

Title II authorizes Programs of National Significance, research intended to help states develop their own service delivery systems. Additionally, Title II includes training and public awareness projects that provide new training opportunities. Extra funds from this section can be used to educate individuals about the benefits of training people to use new devices.

# IV. EXAMPLES OF ASSISTIVE TECHNOLOGY

In 1985, there were over 18,000 devices to aid the functionally impaired elderly (U.S. Office of Technology Assessment, 1985). There are considerably more today. These devices are not all sophisticated computerized systems. They range in price and complexity from a $3 modified eating utensil to a $25,000 reading machine for a blind person to a multi-hundred thousand dollar communication voice simulator.

Many are not designed as assistive devices for people with disabilities, but to make life easier for anyone--for instance, a sound sensitive light switch. With the plethora of assistive devices on the market, an entire house can be renovated to enable a functionally impaired person to carry out his or her daily life independently.

In the kitchen, eating and cooking utensils can be fitted with oversized handles for easier gripping. This "assistive device" can enable an 85 year old with arthritic fingers and hands (lie Ida P.) to continue to prepare meals for herself.

Another kitchen-related assistive device is an automatic feeder, controlled by a chin switch or and hand/foot switch, so that people who cannot hold eating utensils due to tremor or spasticity of the hands and arms can feed themselves.

Assistive devices are frequently found in the bathroom. Grab bars around the tub are easily installed and help prevent falls. Shower benches, bathtub lifts and a door on the bathtub not only alleviate some need for human assistance, but make it easier to shower and reduce the risk of slipping.

In the bedroom, ceiling poles around the bed can make it easier to get in and out of bed. Bedside controls for lights and other appliances increase the ability of mobility impaired people to control the lighting, temperature or other conditions of their home without getting out of bed.

For the functionally impaired elderly living in multi-level housing, wheelchair lifts and stair-climbs allow for full access and mobility throughout the house. Individuals with hearing impairments can benefit from a simple blinking light instead of a doorbell. Large handled combs and brushes and velcro fasteners for clothing help people with limited manual fine motor abilities.

These are but a few of the many devices available. New assistive devices that range considerably in price, technical sophistication, quality and suitability are constantly appearing on the market.

# V. ROBOTS: A GLIMPSE AT THE 21ST CENTURY

Robotics is an emerging field that could benefit people with cognitive impairments as well as those with physical disabilities. For people in the former group, a robot could remind the person when to do certain daily activities, such as eat, bathe, or go to bed. It could also monitor the individual's safety and contact others when help is needed.

For example, falls are the most common cause of severe injury or accidental death among the elderly. A robot that could recognize when a person has fallen could automatically "beep" a pager or telephone for help. Robots that perform simple tasks, such as reminding a person that the stove or iron is on, could reduce the incidence of serious accidents.

Two of the most difficult tasks for elderly individuals with physical impairments are sitting down and standing up. A robot that could assist with these actions would be very valuable, and could possibly substitute for human assistance.

# VI. CAN ASSISTIVE DEVICES SUBSTITUTE FOR HUMAN HELP?

Will assistive devices be able to replace human assistance? Due to technological advances, devices have been able to substitute for human assistance in some cases. However, for most people, assistive devices supplement human help. In the end, the answer to the question depends on which segment of the heterogeneous elderly population is being discussed.

The functionally impaired elderly fall into three broad categories.

### *THE MILDLY IMPAIRED*

The first group includes about 1.4 million people who have relatively mild impairments, such as mild arthritis, and can generally get by without help from other people.

Within this group, assistive devices can be a great boon, even substituting for help that would otherwise have to be provided by another person. Examples include an elderly person with arthritis, who, with modified pot handles and knives, can cook for himself, and a person who can shower using a grab bar and shower seat.

### *THE MODERATELY IMPAIRED*

The second category includes persons with moderate impairments, those who are functionally impaired in one or two activities of daily living. An example is an individual with arthritis plus the loss of leg movement. For people in this group, assistive devices tend to supplement informal or formal home care.

For those in this second group, while the assistive devices do take some of the burden off of the home care provider, they may not be able to make the person completely independent. For example, a stair-climb may allow a disabled elderly person to move independently among floors; however, the person may not be able to toilet independently, and would still require human help.

### *THE SEVERELY IMPAIRED*

The third category of the impaired elderly currently makes little use of assistive technology. This group includes approximately 2.5 million people with multiple health problems and severe functional limitations. Often these individuals cannot perform three or more activities of daily living. Such persons may have severe cognitive impairments, as well as several physical impairments such as loss of arm and hand movement.

The remarkable adaptations of assistive technology to the needs of younger disabled persons (such as quadriplegics) plus anticipated advances in miniaturization of devices, computers and communications may open new possibilities for the use of assistive technology by the severely impaired elderly.

## VII. BARRIERS TO ACCEPTANCE

Despite the availability of thousands of devices designed to enhance life for the functionally impaired elderly, assistive technology has not been fully successful in the geriatric marketplace (RESNA, 1990:100).

Experts attribute this to four factors: (a) inadequate training and orientation for the elderly consumer; (b) inappropriate match of assistive device to the person's need; (c) unwieldy designs; and (d) failure to realize that assistive technology involves more than just giving a person a device.

### *INADEQUATE TRAINING*

Caregivers report that older people appear to have a great deal of hesitancy to use new technology. Until recently, researchers attributed this apprehension to a decreased ability to learn in the elderly. However, recent studies show that the elderly do indeed retain their ability to learn, but may require unique training approaches (RESNA, 1990:100).

The way the new technology is taught has a critical impact on the elderly individual's comprehension and on the success of the person's use of the device. (RESNA, 1990:100) Researchers and trainers have found the following teaching guidelines to be helpful.

1. ***Caregivers and instructors must have a positive, realistic attitude***. Negative attitudes and unrealistic goals can result in frustration by the consumer and ultimate rejection of the device.

2. ***The instructor should be well known, or at least familiar, to the elderly person***. This familiarity will increase the person's level of trust and willingness to experiment with the new device. The training should occur in the individual's home, as people comprehend more under comfortable circumstances than in an unfamiliar place. At home, an individual can be much more at ease and is better able to focus on the training.

3. ***The instructor must allow sufficient time to permit a series of short, repetitive training sessions to reinforce the material***. Older persons can learn new technologies, particularly if the instructional process takes into account their age and frailty. Since frail older persons tire more easily than the young, instructional sessions should be shorter. Frequent, careful, properly spaced repetition of steps can reinforce the learning of skills needed to operate assistive devices.

4. ***The instructor must emphasize to the elderly individual how valuable the assistive technology will be, and how much it will contribute to the person's independence***. If the individual feels that the technology is not critical to his or her independence, there will be less incentive to use it.

5. ***The technology must be explained to the family members and caregivers in addition to the elderly person***. To overcome many of the early concerns and problems, it is critical that everybody who participates regularly in caring for the elderly individual understand (and not fear) the device.

### *INAPPROPRIATE MATCH*

While quality training is fundamental to help elderly people accept and use assistive devices, choosing equipment that matches the person's needs is another key to success. The misapplication of technology can be both costly and time consuming.

People often overlook the importance of purchasing the equipment that best fits a person's needs. In addition, case managers are often not trained to understand assistive devices and help elderly people choose and use the right ones. The result can be that an elderly individual never learns the full capabilities of a device and misses out on some of its potential benefits.

Certain devices may be purchased more frequently because they are the ones case managers, consumers or caregivers know about. One way to remedy this problem is to educate caregivers on how to assess a person's need for assistive technology and help a person choose the right devices.

Matching an individual's needs and abilities with appropriate equipment requires a solid knowledge of physical needs assessment techniques and a strong background in the constantly changing field of available technology.

### *UNWIELDY EQUIPMENT*

Many observers suspect that one reason elderly individuals are reluctant to use some assistive devices has to do with the design of the equipment. One stigma is that the device will detract from the person's appearance (RESNA, 1990:101). Many devices appear bulky or cumbersome; consequently, elderly people reject them.

A new approach to design, with ample consideration for aesthetics, can help address this problem. One way to make designs more appealing and suitable is to encourage input into the design of assistive devices from people with disabilities.

### *MORE THAN A PIECE OF EQUIPMENT*

Individuals can often be given a new piece of equipment, a pair of glasses for example, and taught to use it relatively quickly. More frequently, however, the concept of "assistive devices" encompasses ongoing technological support services, like training and maintenance.

This broader concept of assistive technology may not mesh well with the traditional service delivery system, which is geared toward cure, closure or some other fixed goal. Difficulties may crop up when it is time to provide and pay for maintenance or replacement of equipment. Policymakers need to be aware of the ongoing costs of many devices; equipment is not always a "one shot" solution.

## VIII. ADVANTAGES OF ASSISTIVE TECHNOLOGY

Assistive technology offers a number of advantages to those who are in a position to use it.

### *SAVING MONEY AND IMPROVING LIFE QUALITY*

Assistive devices have the potential to save money and improve the quality of life for many elderly disabled individuals. The U.S. Office of Technology Assessment (1985) noted that, for some individuals, assistive devices can delay or prevent institutionalization, resulting in enormous personal and financial savings.

### *HELPING PEOPLE REMAIN FUNCTIONALLY INDEPENDENT*

The range of assistive devices available today can allow elderly individuals to remain functionally independent in their communities, with fewer in-home services. Reducing the need for formal home care services could put a dent in the $44 billion spent annually on long term care for the elderly (Under Secretary's Task Force Report on Long-Term Care; 1991:3-3--DRAFT).

The benefits of assistive devices go beyond cash savings. Most important, with the help of assistive technology, many elderly disabled people can remain independent for a longer time. Assistive devices are instrumental for many people to perform activities of daily living.

Without assistive technology, the estimates of elderly persons with disabilities rise substantially. Using assistive devices, approximately 725,000 people can bathe independently, and close to 1.4 million can use the bathroom without human help. Under Secretary's Task Force Report on Long Term Care; 1991:2-16,17--DRAFT). Even simple technology, like velcro closures on clothing, could enable people to dress themselves, alleviating the need for some help from others.

### *INSTITUTIONS CAN SAVE MONEY*

Institutions that serve the elderly can also save money when they use assistive devices properly. With greater use of assistive devices, some observers speculate that nursing facilities and other residential settings can either reduce staff, or use existing staff more productively, and thereby cut operating costs and increase efficiency.

### *BENEFITS TO CAREGIVERS*

Assistive devices benefit caregivers as well as elderly individuals. Over one-third of all informal caregivers are over age 65, and many are themselves disabled (U.S. Senate, 1990:21) While informal caregivers are generally unpaid, the care they provide is definitely not "free."

They often provide care under stressful circumstances (e.g., they are sick themselves, the service they provide degrades their own health, they have to cut back on their own social lives, etc.). (Under Secretary's Task Force Report on Long Term Care; 1991; 2-25--DRAFT).

More widespread use of assistive devices could alleviate some of the need (and demand) for informal care. Consequently, assistive devices could take some of the pressure off of informal caregivers. Preliminary analyses of the 1989 National Long Term Care Survey indicate that the use of assistive technology is increasing while rates of informal caregiving are declining.

# IX. DISADVANTAGES OF ASSISTIVE DEVICES

Although elderly individuals with functional impairments can realize tremendous benefits from assistive devices, technology brings with it problems and disadvantages too. Many of the problems result from mismatches between individual needs and assistive devices. What works beautifully for one person, may be a dismal failure for another, due to unique characteristics of the people involved.

### *PERSONS WITH MULTIPLE IMPAIRMENTS*

Many assistive devices are designed on the premise that they can compensate for a person's impaired ability. However, when an elderly person has more than one impairment, the ability to use the device may be impaired as well.

Consequently, certain assistive devices may not be as effective for people with multiple ADL impairments. Finding the appropriate device for an individual with a particular set of impairments can be time-consuming if one lacks broad knowledge of the market (Office of Technology Assessment, 1985:215).

**Alice T. is 82 years old and has severe osteoporosis and a respiratory problem. She would like to use crutches to help her get around, but her respiratory problem impairs her stamina. While the device would be quite helpful to her if she had only one problem, her multiple disabilities make it difficult to use the crutches. A more complex (and costly) assistive device like a motorized wheelchair may be needed.**

### *PROBLEMS FOR PERSONS WITH COGNITIVE IMPAIRMENTS*

For cognitively impaired people, assistive devices can be difficult to understand and use correctly. Cognitive impairments are estimated to affect about half of the nursing facility population and about one-fifth of community long term care recipients (U.S. Office of Technology Assessment, 1985:215).

Potential users of assistive devices need to be evaluated for their cognitive abilities to use the devices. Confusion and reasoning difficulties can restrict a person's ability to get the most out of technology. In addition, memory-impaired persons may forget where they put an assistive device or forget its purpose and how to use it.

Advances in microprocessor technology may overcome some of these limitations. Computerized systems of reminding or cuing the cognitively impaired on the location and use of assistive devices appear feasible. More research in this area is needed.

### *NEGATIVE SOCIETAL ATTITUDES*

There exists a bias in American society against rehabilitation of the elderly. Many people accept "the stereotyped view that deterioration is inevitable" (Office of

Technology Assessment, 1985:216). Rehabilitation of older people has not been a priority.

Sociologists attribute this bias to the fact that many elderly persons are no longer in the workforce; as a result their contributions are not adequately valued and investments in improving their functional abilities may be judged as not worth the cost. Evaluating the rehabilitation potential of the elderly is difficult, since so few are offered the opportunity (Kane, Kane and Arnold, 1983).

# X. WHO PAYS FOR ASSISTIVE DEVICES?

None of the four major sources of health care funding for the elderly (Medicare, Medicaid, private insurance and out-of-pocket payment) offer comprehensive coverage for assistive technology. However, the Department of Veterans' Affairs (DVA) and some new private financing arrangements may offer new options to pay for assistive devices. In this section, each of the public and private funding alternatives are briefly described.

### *MEDICARE*

The Medicare Part B program will pay up to 80% of the cost of assistive technology as long as the devices meet the Medicare definition of "durable medical equipment" (DME). Medicare policies define durable medical equipment as items that are "primarily and customarily used to serve a medical purpose, and generally are not useful to a person in the absence of illness or injury" (U.S. House of Representatives, 1991; 154).

Many assistive devices, such as electric garage door openers, microwave ovens, and golf carts, were designed for the fully mobile, independent adult. Medicare does not cover most of this type of items.

### *MEDICAID*

Medicaid may pay for assistive devices if a person meets the eligibility requirements for the program. However, since Medicaid covers only 13.5% of the elderly population, it is not a viable financing option for most older citizens. (Under Secretary's Task Force Report on Long Term Care, 1991:3-5--DRAFT). In addition, there is considerable variation among state Medicaid programs in their coverage of assistive devices. Consequently, individuals are forced to look elsewhere for financial assistance, most notably to the private sector.

### *DEPARTMENT OF VETERANS' AFFAIRS*

The Department of Veterans' Affairs purchases more assistive devices for individuals with disabilities than most other agencies. In addition to buying millions of dollars worth of hearing and seeing aids and wheelchairs, the DVA also buys

automobile/van adaptive aids, patient lifts, hospital beds and other medical equipment. It also offers a clothing allowance benefit to replace clothing that is ruined when using assistive devices.

Although a person must be eligible to receive DVA benefits, DVA is considered by many to be a model payment system. It has a very systematized structure to pay for its large volume of equipment purchases. It uses enormous amounts of resources to educate and train clinical personnel in the use of assistive devices.

Furthermore, it supports and extensive staff of equipment procurement specialists. DVA also invests in research and development, evaluation, promulgation of standards, and development of procurement guidelines for assistive devices. (Reeb, 1989:1)

The DVA payment system is quite comprehensive, compared to other third party payment systems. The program covers traditional medical equipment such as artificial limbs and wheelchairs, as well as products that typically fall outside the medical bailiwick, such as automobile and home modifications.

### *PRIVATE PAYMENT SYSTEMS*

Two common methods of private health care funding are payments made directly by consumers ("out of pocket payments") and private insurance. For less costly devices, such as modified eating utensils and simple object grabbers, out of pocket payment is reasonable. However, more complex equipment, such as electric wheelchairs, are often unaffordable to the average disabled elderly individual. For these major purchases, people often turn to private insurance.

A key problem with private insurance policies is that they frequently won't pay for off the shelf products, even when the products are effective and less stigmatizing. According to RESNA, "if an in-home device looks desirable or useful to an able-bodied person, or if it looks like a luxury or convenience to a completely functional person, funding will be denied." (RESNA, 1990:458)

Two alternative methods of paying for assistive devices are assistive financing and subsidy financing. Assistive financing, or loan guarantee, involves a partnership between a private financial institution and another organization interested in underwriting credit financing to targeted populations. This type of financing allows people to pool costs and risks.

Historically, banks have been hesitant to make loans for assistive devices to elderly people because the applicants generally have limited financial resources and the equipment would have minimal resale value. With assistive financing, an interested third party assumes some of the repayment obligation, thus reducing the bank's risk.

Assistive financing has two major benefits. First, since it requires consumers to contribute to the cost of the product, it encourages them to use it more effectively. Second, it taps funding from the extensive resources of the private credit industry.

Although assistive financing systems are still evolving, many successful programs are already underway. In 1988, the Mitarai/Canon Optacon Financing Program began extending low interest loans to eligible applicants for the purchase of the Optacon II, a reading device for the blind (Reeb, 1989:7).

Subsidy programs are a second alternative for financing assistive devices. These programs provide equipment at reduced cost or for free. The subsidy may be in the form of a grant, a rebate, or a discount. It may target specific products, or an entire product line.

Subsidy programs promote broader distribution and encourage people to use devices they might not otherwise consider. Many private and nonprofit organizations, such as Associated Services for the Blind and United Cerebral Palsy Association of Western New York, have developed specific subsidy programs.

# XI. MUCH TO LEARN: RESEARCH NEEDS

In the emerging, evolving field of assistive technology, there are several gaps in the research. First, studies need to be undertaken to determine the costs and benefits of assistive devices compared to human assistance. It is possible that despite the high cost of certain assistive devices, the ultimate costs may be lower than ongoing human assistance.

The field needs empirical research to determine the effect of the use of assistive technology on other types of services. In addition, the benefits in terms of increased independence and quality of life need to be measured.

The field also needs to undertake more research on better ways to get out information on assistive technology. Research should be undertaken to determine the most effective ways to inform professionals, families and consumers about new devices, the best ways to use them, and ways to pay for them.

Physicians and case managers, especially, need to have ready access to information about assistive devices and how to use them. It is likely that with more and better information, disabled elderly individuals would be able to select more appropriate equipment and use it properly.

Finally, the prices of assistive devices need to be explored. For instance, there are many inexpensive assistive devices that could be very useful to certain disabled elderly individuals. These devices need to be identified and cataloged. Furthermore,

research should be undertaken to figure out how to make expensive devices more affordable to elderly individuals.

# XII. POLICY CONSIDERATIONS

In this writer's opinion, the goal of public policy regarding assistive technology should be that functionally disabled elderly individuals receive the most appropriate mix of active help, standby help and assistive technology to overcome or compensate for their limitations and live as independently as possible.

Policymakers should understand that a single form of technology is often not the only answer for a certain functional limitation, nor is it always economically or medically advisable to substitute devices for human help. Other approaches, such as personal assistance, learning new skills, and adapting to a new environment can be equally or more beneficial.

To increase the development and application of assistive technology, policymakers must focus on four issues.

1. ***Public policy needs to make assistive technology more affordable and accessible***. If assistive technology is to reach its maximum potential, disabled elderly people will have to be able to afford it. Policymakers could make a significant contribution by focusing on helping middle class individuals buy assistive devices--these individuals are too wealthy to qualify for many public programs, yet too poor to afford the devices out-of-pocket.

   In addition, there is a vital need to develop a comprehensive reimbursement plan that can avoid fragmentation and allow for service packages that combine human assistance and assistive devices.

2. ***Information on assistive devices must be more available***. Often devices are not used, or the wrong devices are used because of poorly trained clinicians who lack access to up to date information. Policymakers should especially focus on getting information out to people who have direct contact with disabled elderly individuals who are poor and living in isolated areas.

3. ***Policy should not be based solely on economic factors***. Policymakers should avoid creating situations in which a person purchases a specific device simply because it is subsidized, even though it may not be the best fit for the circumstances. This policy concern relates to both information dissemination and financing.

   Observers have noted that existing policy reimburses for a relatively narrow range of available equipment. This can lead to inequitable resource allocations and inhibit individuals' ability to select the best combination of options for community living. An

additional concern is that advocates for specific types of assistive devices that are not reimbursed will be quite active in trying to get their services recognized.

4. ***Functionally impaired individuals should have the opportunity to participate in deciding which type of device they will use and decisions should never be considered final***. The decision should be made after a thorough assessment, and should be reversible if the individual discovers that the device is not the best match for their skills, impairment or motivation level. In addition, the choice should take into account that the most beneficial situation for a person may include a combination of assistive devices plus human help; under current policies, people may be forced to choose one or the other.

# XIII. CONCLUSION: NEED FOR COORDINATION

In this writer's opinion, the major barrier to assistive technology is the severe fragmentation of the community service delivery system and its financing structures. Several agencies provide assistive devices, or counseling or training on how to use them, or financing for them, but there is not a smoothly coordinated system.

Although some people can get some devices and receive support to use them properly, the delivery system appears to be rife with confusion in coverage policies, gaps in service, and an overall lack of continuity. While P.L.100-407 was welcomed in the field, it also contributed to the confusion and lack of coordination among public and private systems.

The highly divided financial support system fails to encourage the development of coordinated services that could provide access to appropriate assistive devices. The U.S. is quite advanced technologically; unfortunately, due to the lack of coordination in the service system, disabled elderly individuals do not reap the maximum benefits from this level of sophistication.

While the Technology Related Assistance for Individuals with Disabilities Act is a step in the right direction, its ultimate success will lie in its ability to serve as a foundation, upon which we build an entire, coordinated delivery system.

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# NOTE

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