ASSISTIVE TECHNOLOGY FOR INDIVIDUALS WITH COGNITIVE IMPAIRMENTS

A Handbook for Idahoans with Cognitive Impairments and the People Who Care for Them

Promoting greater access to technology for Idahoans with cognitive impairments
Acknowledgements

A number of people need to be thanked for their assistance in making this handbook a reality. First, a big thank you goes to the staff of the Idaho Assistive Technology Project for their help in conceptualizing, editing, and proof-reading the handbook. A special thank you to the North Dakota Interagency Program for Assistive Technology (IPAT), and especially to Judy Lee, for allowing the use of their materials related to assistive technology and people with cognitive disabilities. A special thank you also goes to Edmund Frank LoPresti, Alex Mihailidis, and Ned Kirsch for allowing the use of their materials connected to assistive technology and cognitive rehabilitation.

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Statement of Purpose

This handbook is designed as a guide for individuals, families, and professionals in Idaho who are involved with persons who experience cognitive disabilities. The application of assistive technology for meeting the needs of individuals with cognitive disabilities is still in its infancy in Idaho. This handbook was developed to increase knowledge and expertise about the use of assistive technology for this population. The handbook also provides information about how to locate funding for needed devices and lists a broad array of resources related to this topic. The handbook is designed to provide information that can be used by persons of all ages. It also provides information that can be used in a wide variety of settings including the home, community, school, and work.

The Idaho Assistive Technology Project is funded under authority of the Assistive Technology Act of 1998 as amended. The IATP is funded through the Rehabilitation Services Administration, United States Department of Education. The Center on Disabilities and Human Development at the University of Idaho is the lead agency for the project. (CFDA No. H224A070012)

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Idaho Assistive Technology Project
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December 2007
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To the Reader

There are literally thousands of assistive technology devices that hold the promise of overcoming or at least diminishing the challenges faced by individuals with cognitive disabilities. Unfortunately, not all of these devices can be neatly placed into one category or another. For example, a particular device might be useful for addressing both memory loss AND distractibility. This creates the significant challenge of organizing the information in this handbook in a way that is useful to the reader.

In order to keep things simple, Section III—Assistive Technology and Environmental Interventions for Individuals with Cognitive Impairments, which is by far the largest section of the handbook, is divided into four sections: (a) Technology for Overcoming Challenges Associated with Distraction, Memory Loss, Ability to Organize, and Task Completion; (b) Aids for Daily Living; (c) Aids for Safety and Security; and (d) Technology for Addressing Learning Disabilities.
ASSISTIVE TECHNOLOGY FOR INDIVIDUALS WITH COGNITIVE IMPAIRMENTS

INTRODUCTION

The concept of cognitive disabilities is extremely broad and not always well defined. In general terms, a person with a cognitive disability has greater difficulty with one or more types of mental tasks than other people do. There are at least two ways to classify cognitive disabilities: as a functional disability or as a clinical disability. Clinical diagnoses of cognitive disabilities include autism, Down syndrome, traumatic brain injury (TBI), and even dementia. Less severe cognitive conditions include attention deficit disorder (ADD), dyslexia (difficulty reading), dyscalculia (difficulty with math), and learning disabilities in general.

However, while clinical diagnoses may be useful from a medical perspective for treatment, classifying cognitive disabilities by functional disability is more useful in terms of living independently in the community. Functional disabilities ignore the medical or behavioral causes of the disability and instead focus on the resulting abilities and challenges. Using this approach, cognitive disabilities impact the capacity of an individual to:

- think
- concentrate
- react to emotions
- formulate ideas
- problem solve
- reason
- remember

There is now a solid research base supporting the concept that using assistive technology can improve the quality of life for persons with developmental disabilities, physical disabilities, and cognitive impairments. Assistive technology (AT) includes kitchen devices, electronic communication systems, reachers, wheelchairs, computer adaptations, velcro, walkers, and thousands of other commercially available devices. AT has become more widespread and now includes more than 20,000 devices. The availability of assistive technology devices and services enables individuals with disabilities to have greater control over their own lives; participate in and contribute more fully to activities in their homes, schools, work environments, and communities; interact to a greater extent with non-disabled individuals; and benefit from opportunities that are taken for granted by individuals who do not have disabilities (Hosmer, 1995).

However, even given the tremendous promise of AT, there remain systemic barriers to its widespread use. Many individuals with disabilities have little awareness
about the wide range of devices that are currently available. Funding resources for equipment continue to be fragmented and slow to obtain. Many professionals do not possess the expertise and experience needed to effectively use AT. All of these societal problems are exasperated when attempting to apply AT solutions to address the needs of individuals with cognitive impairments. According to Lynch (2002), “any assistive technology for people with cognitive disabilities must accommodate the individual user’s skills and deficits. This is complicated by the fact that each person will have a unique combination of strengths and weaknesses. A prospective memory aid that requires a great deal of self-initiation and problem solving skills will be useful for some clients, but will only exacerbate difficulties for others. Similarly, while mainstream computer software has great potential to assist people with cognitive disabilities (e.g., software for time and money management), existing software is often either too complex or not age appropriate for adults.”

This handbook is designed to provide information about AT available to overcome the impact of cognitive disabilities. It was developed with the goal of providing assistance to individuals with cognitive impairments and the people who care for them. The handbook is divided into five sections:

1. Introduction
2. Technology-Related Definitions
3. Assistive Technology and Environmental Interventions for Individuals with Cognitive Disabilities
4. Funding for Assistive Technology
5. Resources for Assistive Technology and Cognitive Disabilities
II.

Technology-Related Definitions

There are a number of formal and informal terms and definitions that describe the technology used to improve life for individuals with disabilities and older persons. In many cases, these definitions are vague at best and often overlap. In the medical arena, assistive technology interventions are often referred to as “durable medical equipment,” “environmental adaptations,” or “prostheses,” among other terms. In the vocational rehabilitation community, devices are referred to as “rehabilitation technology” and in education, the terms “assistive technology” and “education technology” are sometimes used interchangeably. The term “home modification” is another term often associated with assistive technology, because modifications to the environment often include the use of assistive technology.

Assistive Technology

Assistive technology (AT) is defined in federal legislation as any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. Examples of AT include wheelchairs, electronic communication systems, reachers, computer adaptations, walkers, and thousands of other commercially available devices.

Educational Technology

Educational technology is sometimes referred to as “e-learning,” “instructional technology,” or “learning technology,” and usually refers to the use of technology to support the learning process. Although the term can refer to all kinds of related technologies, e.g., photographs, films, videos, audio recordings, etc., it is usually used to talk specifically about computer technology.

Durable Medical Equipment

Durable medical equipment (DME) generally consists of items that can withstand repeated use and that are primarily and customarily used to serve a medical purpose that is usually not useful to a person in the absence of illness or injury. Examples of DME include items such as iron lungs, oxygen tents, hospital beds, wheelchairs, and seat lift mechanisms that are used in the patient’s home and are either purchased or rented.

Cognitive Orthoses/Cognitive Prosthetics

The terms “cognitive orthoses” and “cognitive prosthetics” are used interchangeably and are defined as compensatory strategies that alter the patient’s environment and are directed to an individual’s functional skills (Kirsch, Levine, Fallon-
Kreuger & Jaros, 1987). Cole (1999) expanded this definition in his 1999 review of the field to include the following attributes of a cognitive prosthetic:

- Uses computer technology;
- Is designed specifically for rehabilitation purposes;
- Directly assists the individual in performing some of his/her everyday activities;
- Is highly customizable to the needs of the individual.

**Rehabilitation Technology**

The term “rehabilitation technology” refers to the systematic application of technologies, engineering methodologies, or scientific principles to meet the needs of and address the barriers confronted by individuals with disabilities in the areas of education, rehabilitation, employment, transportation, independent living, and recreation. The term includes rehabilitation engineering, assistive technology devices, and assistive technology services.

**Home Modification/Environmental Adaptation**

“Home modification” includes any change to a home that fosters the independence and safety of individuals with disabilities or that allows people to carry out their daily tasks more easily (Pynoos, 1998). Home modifications can range from installation of inexpensive items (e.g., grab bars) to more costly structural changes such as widening of doorways, renovation of bathrooms and kitchens, and installation of ramps. Home modification is often referred to by the more general term “environmental accessibility adaptation.” Examples of home modifications include removing throw rugs to prevent slips and falls, installing grab bars in the bathroom for stability, and building a ramp up to the entrance of a home.
III.

ASSISTIVE TECHNOLOGY AND ENVIRONMENTAL INTERVENTIONS FOR INDIVIDUALS WITH COGNITIVE DISABILITIES

Technology for Overcoming Challenges Associated with Distraction, Memory Loss, Ability to Organize, and Task Completion

Technology for Reducing Distractibility

Small changes can help reduce distractions. Equipment with too many controls or functions can be confusing to some people. Placing shields or color codes on the unneeded controls can help with this problem. Putting partitions around a work area can reduce distractions. Office noise can be reduced by turning equipment off when it is not in use or by closing the door to those areas. Earphones provide a person with a masking noise to help block out sound distractions. FM systems and auditory feedback devices (with earphones) improve focus by enhancing a speaker’s voice so that it is more obvious.

Technology for Augmenting Memory Loss

There are a number of commonly available devices that can help augment the memory of an individual with a cognitive disability. Clocks, calendars, telephones, personal data assistants, tape recorders, and pagers, when used creatively, can have a great impact on the independence of individuals with cognitive disabilities.

Early work on memory aids investigated the application of commonplace technologies, such as clocks and calendars (Harris, 1978) or timers and digital watches (Jones & Adams, 1979, Klein & Fowler, 1981, Wilson, 1984). These technologies are inexpensive, easy to use, and have no social stigma that might otherwise be attached to “rehabilitation” devices. However, these devices have limitations in the amount of information that can be stored and how information can be presented to the user. More importantly, written lists and calendars provide no prompting to the user as to when he or she needs to perform a task.

Phones with speed dial can reduce the need to remember numbers. Some phones, such as the Clarity P-400, have large speed dial buttons that have spaces for symbols or photos that represent telephone numbers. This feature is useful for people who cannot read well or who have memory problems. TTYs are small telephone devices with keyboards and visual displays and are designed for people with hearing and speech disabilities; however, they have also been used by other people with memory problems to keep track of conversations. TTYs have delayed reaction time and can provide a printed display of the telephone conversation. The printer model allows the user to print and keep a copy of the conversation to review later if necessary.
Personal Data Assistants (PDAs) and other similar hand-held devices have a touch screen that helps a person to input, save, and retrieve notes. They can also be used to store phone numbers, dates, and daily reminders. PDAs also have a calendar that displays the entire month. You can use the cursor to move from day to day or month to month. PDAs offer a portable solution for keeping appointments, reminders, and contact information for family and friends close at hand.

People who have problems remembering a sequence of tasks can also use audio tapes. A task can be broken down into its component steps and an audio recording can be created outlining these steps. This recording can be used to guide the person through work and can be repeated until the task is done. There are also large button switches that can be used to guide individual tasks or to prompt a person about when to complete each step of the job. Some AT interventions seek to provide support with planning and problem solving as well as memory. The Planning and Execution Assistant and Training System (PEAT, Attention Control Systems Inc, Mountain View, CA) uses artificial intelligence to automatically generate daily plans and re-plans in response to unexpected events.

A pager can be used to remind a person to be attentive to the task at hand and when to move on to the next task. Computer-based pagers can be used to assist individuals by relaying reminders from a computer to a commercial paging carrier that, in turn, relays the message to the person in school, at work, or in the community. These devices can reduce the need for a job coach by giving the person reminders as well as providing direction and guidance. For example, a device could be set to send a message saying “time to clean up” and 10 minutes later saying “go to the bus.” This works well for someone who cannot remember all the steps in their tasks at work.

Technology for Supporting Organizational Skills
(LoPresti, Mihailidis, Kirsch)

Many people are able to use personal calendars or daily planners to manage time and complete tasks. Other simple solutions are portable timers, alarm clocks, and watches with alarms. All of these can be set to ring when a task needs to begin, finish, or change. Computers can help with attention, planning, and finishing tasks. Daily planner software can help organize daily and monthly activities. Computer tutorials give training that can be repeated many times. People with cognitive disabilities need software that is multi-sensory, that can be personalized, that reinforces, and that can motivate. It needs to provide a predictable routine.

Technology for Assisting with Task Completion
(LoPresti, Mihailidis, Kirsch)

According to Hersch (1994) and others, “For individuals with deficits in self-initiation, a device which can call itself to the person’s attention will be better able to facilitate activity performance.” However, while a standard alarm wristwatch or timer will provide an audible cue, it will not provide information about the task to be performed. An alarm wristwatch can be combined with a
written list so that whenever the watch alarm sounds the person refers to the list for information. However, this latter intervention requires that the client both associate the watch alarm with the need to refer to the list and remember to use (and carry) both the watch and the list. This can be inconvenient for people with mild memory impairments, and difficult or impossible for people with more severe memory or executive function deficits. Therefore, it is sometimes useful to have a single, easily portable device that provides both an external cue and relevant information.

The IQ Voice Organizer™ and Data Link Watch are two examples of memory aids designed for and marketed to the mainstream population, rather than specifically for people with cognitive disabilities. Scheduling and reminder software is also available for standard palmtop computers, such as those running the Palm (Palm Inc, Mipitas, CA) and Windows CE (Microsoft, Redmond, WA) operating systems. These devices may be more readily available than devices designed for people with disabilities. They may also be more acceptable to clients since they are “normal” devices. Other devices, such as ISAAC (Cogent Systems, Inc.), CellMinder (Institute for Cognitive Prosthetics, Bala Cynwyd, PA), and the Planning and Execution Assistant and Training System (PEAT, Attention Control Systems Inc, Mountain View, CA) have been designed specifically for individuals with cognitive disabilities. They provide more support for people who would have difficulty independently entering their schedules into more complex devices, and are designed with physical and sensory limitations in mind.

Other things you can do to make life easier…

- Post an outline of daily job tasks on a single sheet of paper, perhaps using symbols, pictures, or maps rather than printed words.
- Arrange materials for a task in the order in which they will be used, such as setting out clothes for the day in the order in which they need to be put on (underclothes, shirt, pants, socks, shoes).
- Establish clear guidelines that vary little from day to day.
- Simplify and reduce the number of choices, eliminating the possibility of "wrong" choices.
- Reduce the actual number of tasks by limiting the number of steps or by breaking them into smaller and more clearly defined steps.
- Reduce environmental clutter.

Technology for Daily Living

There are many adapted devices for helping people with cognitive impairments to remain at home and in the community. Some are specialty items, while others are available through local stores.
Kitchen Devices

Try a microwave or toaster oven that shuts off on its own. Many stores carry products that shut off automatically, such as coffee makers and irons. A variety of devices are available that can add alarms and shut-off features to standard products. Simple timers and watches can be set to remind an individual that the stove is on or the cake is done. These devices can also give reminders to lock the door, take medicine, or call a loved one. Forgetting to turn off the water can result in damage to homes and offices. To prevent these problems, devices are available that control water flow in various ways. Electric-eye faucets turn the water on when they sense a person’s hands in the sink, and turn the water off when the hands are removed. Another option is a stick-like attachment that hooks on a sink faucet. The water is left on all the time, but does not run until the stick is touched gently. When you stop touching the stick, the water shuts off.

Bathroom Aids

There are a variety of ways to alter the bathroom to make it more functional. Splashing sounds can be absorbed by placing carpet on the floor, towels on the bars or racks, and curtains on the windows. If that is not enough, try using cascading faucets where the water slides into the tub or sink rather than splashing. Define the tub by placing light colored mats in dark tubs, and dark colored mats in light tubs. Install grab bars to hold when standing, sitting, or climbing in and out of the tub or on and off the toilet. Have the individual start in a dry tub and let the water fill while they are sitting, or use a bathtub seat and hand-held showerhead. This allows the person to have control over the water. If the bathroom is too much to handle, try a bath in bed with an inflatable bathtub. This tub can be placed under a person lying in bed and then inflated around them. Hoses run from the tub to the bathroom for water and drainage. Garden hoses can be used if the bathroom is far away.

Location Devices

Devices are available to help people find items they have lost. Sometimes a device that was originally created for a different use, such as a wireless doorbell, can also be used to help you locate an item. For example, put the doorbell receiver on something that gets lost all the time. Some key chains now have alarms to signal where they are. Attach one of these key chains to something that gets lost all the time, such as the TV remote, a portable phone, or a pair of glasses. When the item is lost, just whistle or clap and the alarm will beep. Many wireless remotes and telephones now come with built-in locator buttons.
There are many ways to help a person who is disoriented or lost. Put photos on bedroom doors. Have the person wear a medical alert bracelet. This gives people a contact number to call to let the individual know where they live or where someone can come to pick them up. Teach the person to use in-store Help Phones or mall information to get the information they need. There are electronic devices that can be programmed with your voice for phone numbers, directions, reaffirming messages, or next steps. This helps a person maintain independence.

Global Positioning Systems (GPS) are available that can track an individual's location anywhere on the planet. These hand-held devices receive signals from a satellite. Some GPS provide tracking while others give specific information on a person's position. Some have wireless e-mail. These devices help keep an individual on track and provide a means to locate them should they get lost.

**Medication Devices**

Many devices are available to help people manage their medication. Pill holders can come with dividers for daily and weekly doses. There are some pill holders with 28 easy-to-load bins inside to hold enough pills for four doses a day for a week, or one dose a day for a month. Just push a button to get the correct pills. Pill alarms sound an alarm when medicine needs to be taken. Pill alarms can come small enough to fit in your pocket. Some alarms are part of a watch. There are some that even replace the cap to your prescription bottle. Some reset to repeat the same reminder, have built-in water, or have lights to tell you which compartment to open.

There are also electric automatic medicine dispensers. These can organize a week's supply of pills and vitamins in a refillable plastic tray. The tray is locked into a machine that delivers the medicine into a tray. An alarm tells the individual when they are supposed to take the medicine, and will buzz until the pills are removed and the tray is replaced. There are some automatic systems that will alert someone if their medicine has not been taken. This has the added benefit of warning others to a more serious medical condition or fall.

**Comforting Aids**

A person can feel better or comforted simply by holding something familiar such as a pillow, a doll, a favorite blanket, or some other personal item. Pets can also play a very big role in making someone feel better. They can entertain, soothe, and comfort people. Pets are used in places like hospitals, rehab centers, nursing homes, and even on the job. When a pet is not an option, a doll or stuffed toy may provide a substitute for some people.

Another aid for providing comfort to individuals with cognitive disabilities is Temple Grandin's "squeeze machine." The machine is a deep pressure device designed to calm hypersensitive persons, usually individuals with autism spectrum disorders. Autism profoundly affects both social interactions and sensitivity to sensory stimulation, often making it uncomfortable or impractical for individu-
As is assistive technology for individuals with cognitive impairments. The therapeutic, stress-relieving hug machine was originally conceived and designed by Temple Grandin at the age of eighteen. Dr. Grandin designed the hug machine so both she and others could turn to it for sensory relief.

The hug machine consists of two hinged side-boards, each four by three feet, with soft, thick padding that form a V-shape. The machine has a complex control box at one end, and heavy-duty tubes that lead to an air compressor. The user lies or squats between the side-boards for as long or short a period of time as desired. Using pressure exerted by the air compressor and controlled by the user, the side-boards apply deep pressure stimulation evenly across the lateral parts of the body.

Environmental Aids

Lighting can make a room clear and friendly. Increase lighting to remove shadows. Leave lights on in dark areas or use nightlights, and have touch lamps to get light quickly. Install touch light controls. They fit between the plug and the outlet. A touch lamp is turned on or off by touching any metal part of the lamp or the cord. Some touch switches have a remote pad that can be used from across the room. Install motion sensor night lights, motion sensor wall switches, or motion sensor lamp adapters. These automatically turn on lights and lamps based on movement. There are also voice-operated light switches that turn on the light by just speaking.

Other things you can do to make life easier...

- Use pictures, charts, or symbols to help clarify directions and explanations.
- Label photos, perhaps putting them in wallet folders, as reminders for those who do not recall familiar people and places.
- Create lists or pictures of the contents of cupboards and drawers.
- Install glass doors so cupboard contents can be seen at a glance.
- Enlarge the print of existing recipes, write out family favorites, and highlight cookbook favorites.
- Attach keys to a bungee cord hooked to a wrist or belt loop.
- Paint door trims along hallways in contrasting colors to make identification easier - bathroom trim blue, bedroom trim yellow, etc.
- Place a poster with a seasonal scene on the back of the front door to serve as a reminder of what type of clothing might be necessary before leaving.
- Put a sign on the front door that says "Jean's House" or use items at the doorway that attract the individual (e.g., bright red geraniums in a pot) to help signal home.
- Keep wall paper patterns, rug patterns, and color schemes conventional; avoid designs with flowers or figures.
- Create maps to use inside and outside the home.
Technology for Improving Safety and Security

Safety and security are important issues for many people with cognitive impairments. Adapted devices can help with many issues like poor balance, shaking, and blurred eye sight. Many devices help stop accidents and reduce the consequences when accidents do occur.

Fire & Smoke Alarms

Carbon monoxide detectors and smoke alarms are good to have in every home. Some of them have flashing lights or bed shakers to go along with their beeping alarms. Fire extinguishers should be located in the kitchen or garage in case of fires. Some fire alarms will dial an emergency number to call for help when the alarm goes off. Sprinklers can be installed in homes to help put out fires. Contact local companies to see what might work best for you.

Water Safety

Water can be harmful and cause damage. There are tub mats that change color when the water is too hot. Special valves for showers prevent the water from getting too hot. Some valves shut off the water when it reaches a specific temperature, and these can be installed in faucets and showerheads. Some devices can also let you know when the water level in the tub or sink gets too high or overflows.

Phones & Pagers

Cordless phones, cell phones, walkie-talkies, and pagers can help in cases of emergency. Many pagers allow the individual to call for help by pushing a button. A receiver beeps or vibrates, telling the wearer that the individual needs help. Highlight speed dial buttons with emergency numbers to make it easier in case of an emergency. Some phones and phone services can also help. The phone has a base station with a speakerphone and a small transmitter. The base station plugs into a power outlet and phone line, and the transmitter can be clipped to a shirt pocket or belt buckle. When you press the button on the transmitter, a signal is sent to the base station. The base station then calls specific numbers for help. These numbers can include family, friends, or 911 operators. The base station will continue calling until it gets an answer.

Aids to Limit Access

Install fences and locked gates around pools, Jacuzzis, or other water areas to keep family members safe. Gate alarms can be installed to alert someone if the gate has been opened. Pool alarms are also available that float in the water. If someone or something falls or drops into the pool, the alarm goes off. Wall-mounted soap and shampoo dispensers help to keep these products out of reach. Locks on cabinet doors and drawers can be used where harmful prod-
ucts are stored. Other common childproof devices such as outlet plugs, stove or oven locks, and fridge locks can also be very helpful. Use baby gates to keep individuals out of harmful areas.

**Stabilizing Aids**

Grab bars and handrails can be used to help people stand and walk. Put them in bathrooms, hallways, work areas, and along both sides of stairs. Handrails also work for people who get dizzy, have coordination problems, or walk with difficulty. If a person stumbles easily, add more light to an area so they can see where they are walking. Use tread grips on stairs or even put in ramps to keep someone from tripping and falling. A person can use a walker for more support when walking and moving around. Some walkers have seats for people to sit on if they get tired or baskets to carry things. The basket can be used to store things like phones or medicine that needs to be accessed quickly or easily. Seat lifts are cushions with springs that help a person stand up and give them support to keep their balance. As the individual starts to rise, the cushion lifts and helps them move up and out of the chair.

**Adaptive Utensils**

If a person has tremors or spasms, they may have trouble holding onto things like cups, utensils, and cigarettes. There are low-tech devices that give support and reduce accidents and frustration. Heavy coffee cups with large handles and wide bottoms are less likely to be tipped. Over-sized ashtrays, which have sand or water added to them, can reduce fire hazards. Utensils with large handles are easier to hold. Knives, forks, and spoons can be easily modified by adding foam tubes or molding putty to the handles. Writing aids are available that are heavier or that have larger platforms to make them easier to hold. A heavier pen will not fly out of someone's hand as easily as a regular pen. If someone has trouble unlocking or locking doors, do not leave the doors unlocked, making the home unsafe. Instead, get grips or handles for the keys to make them easier to hold and provide more leverage to turn them. Key-less door locks are also available that use a swiped card or a keypad.

**Identification**

Some individuals have a tendency to get disoriented and wander. These individuals should wear or carry some type of ID. The ID should include their name, address, and telephone number. Labels can also be used that are sewn or ironed onto clothing. This information should be in a person’s wallet or even worn as jewelry. Medic alert bracelets can let someone know of a special medical need. They can be purchased at local pharmacies. Talking ID’s are also available. Just record a name, address, and phone number, as well as any special needs in
case of an emergency. When the button is pressed, the 20-second message plays, giving someone the information that they need to help.

National programs can be used for a one-time fee. A person is registered and given a bracelet or necklace to wear. This carries a toll-free number and a brief message about what to do if found. Help is available 24 hours a day, 7 days a week, no matter where they are found. When the number is called, the company calls the family.

**Monitoring and Surveillance Devices**

Electronic alarms can be hung on the metal doorknob of any non-metal door. If anyone touches the knob, the alarm sounds. Baby monitors can be used to monitor rooms. Wireless doorbells used in businesses can be put on the bedroom door to notify someone when it is opened. Things as simple as bells or chimes that make a noise when they are moved can also be used. Motion detectors can alert someone when a family member is sleepwalking or wandering. Motion-sensitive lights can also be installed to draw attention to wandering. Some alarms can even be worn. If a person gets past a certain distance, the alarm goes off. This alarm will also assist people in locating the individual. High tech monitoring uses video cameras and microphones that let you see and hear anywhere inside or outside your home. Using a standard TV, you can monitor activity to prevent accidents and to keep everyone safe.

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**Things to Make Life Safer...**

- Color code frequently used items, i.e., edibles like sugar, pudding, and cream are color coded blue; cleaning supplies are color coded red; personal care products like toothpaste, shampoo, and eye drops are color coded yellow.
- Be attentive to the alerting signals that family pets provide regarding visitors and emergency situations.
- Replace or eliminate tools that pose risks.
- Replace metal knives with plastic or rolling blades.
- Attach brightly colored labels to materials that are hot, poisonous, flammable, or otherwise dangerous to identify products that are "off limits."
- Change alternating dark tiles with water-proof paint or contact paper that can be removed later without damaging the floor.
- When mirrors present difficulties, remove them, place something in front of them, turn them around, or cover them with contact paper or water-based tempera paint.
- Increase lighting in shadowed areas such as closets or showers.
- Trim outside bushes and light walkways to eliminate places where someone "could be hiding."
- Use clear shower curtains.
- Place benches or chairs next to outside doorways.
Technology for Addressing Learning Disabilities
(LoPresti, Mihailidis, Kirsch)

One area that has received considerable attention is the understanding and production of written text by people with dyslexia. In compensating for dyslexia and related disorders, computers offer many advantages over traditional media. The computer allows variation of the appearance of text. Once text is committed to paper and ink, its appearance is permanent. Computers offer options such as changing text size and contrast (Keates, 2000). Computers also allow a user to change the color of the text and/or the background, similar to the practice of placing colored screens over text to increase readability (Wilkins & Lewis, 1999). In addition to changing the appearance of printed text, computers can augment visible text using speech, so that a person with good verbal skills and aural information processing can acquire the information without the need to process printed text (Higgins & Raskind, 1997; Raskind & Higgins, 1995).

Speech synthesis software can provide speech output to match text on the computer screen in a word processor or on the computer desktop. Text from books or worksheets can be scanned into the computer and read using optical character recognition software and many books are now available directly in electronic formats. In addition to using speech output as an alternative to text, it is possible to use auditory feedback while viewing the printed text. This software can therefore act as a reading assistant; the person reads most of the text, but has the computer speak unrecognizable words.

MacArthur (1998) studied the use of speech synthesis and word prediction for students with learning disabilities. Five students with learning disabilities wrote in dialogue journals using a standard word processor during baseline phases and a word processor with speech synthesis and word prediction features during treatment phases. For four of five students, percentage of legible words increased from 55% to 85% during the baseline phase to 90–100% during the treatment phase, and the percentage of correctly spelled words increased from 42% to 75% to 90 to 100% (MacArthur, 1998).

Computers also offer alternatives for text production. Some people have difficulty with handwriting due to motor coordination difficulties, or have more difficulty comprehending handwritten text compared to printed text. A keyboard can provide assistance for these individuals, since typing may be easier than handwriting. Typing is also helpful because all letters are visible on the keyboard, compensating for letter recollection difficulties. The position of the characters on the keyboard can also be used to aid recognition; if the person can remember the position of the letter he or she wants on the keyboard, he or she does not need to recall the letter’s shape (Gregor & Newell, 2000).
For individuals who have difficulty typing as well as writing, speech recognition is an option for text entry in the computer. People who have good verbal skills can compose material directly through speech, and the computer will take on the task of translating the words into printed text. In one study of voice recognition, 29 post-secondary students with learning disabilities wrote essays under three conditions: (1) using speech recognition software; (2) using a human transcriber; and (3) receiving no assistance. Essays were scored according to a standardized scoring guide. Subjects received higher scores when using speech recognition than when receiving no assistance (p < .05). Essays written using speech recognition were longer and had a higher proportion of words with seven or more letters (Higgins & Raskind, 1995).

To expand upon available technologies, Gregor and Newell (2000) developed a highly configurable word processing environment, SeeWord, to assist people with dyslexia in reading and composing text. SeeWord was developed within the context of the University of Dundee’s overall research program on human–computer interaction for extraordinary users and users in extraordinary situations (Gregor, Alm, Arnott, & Newell, 1999). This software provides a variety of options related to the visual appearance of the text and of the software interface, and the means for each user to customize these settings to his or her particular preferences.

In addition to difficulties with visual processing and motor coordination, individuals with learning disabilities often have difficulty organizing their thoughts for written compositions (Newcomer & Barenbaum, 1991). Computer software can aid in this organizational process by helping the user create concept maps. Concept mapping is the process of categorizing information into a graphic form, known as a “concept map” or “semantic network.” This visual representation of information can then be used to organize concepts and provide a basis for the structure of written text. Concept mapping has been shown to support more organized and detailed written texts (Ruddell & Boyle, 1989; Zipprich, 1995). Software such as Inspiration (Inspiration Software Inc, Portland, OR) provides a means to easily create and edit concept maps.
HOW CAN I PAY FOR ASSISTIVE TECHNOLOGY?

Medicare

Right now, no single private insurance plan or public program will pay for all types of assistive technology under any circumstances. However, Medicare Part B will cover up to 80 percent of the cost of assistive technology if the items being purchased meet the definition of “durable medical equipment.” This is defined as devices 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.” To find out if Medicare will cover the cost of a particular piece of assistive technology, call 1-800-MEDICARE (1-800-633-4227, TTY/TDD: 1-877-486-2048). You can also find answers to your questions by visiting the website at www.medicare.gov on the Internet.

Medicaid

Depending on where you live, the state-run Medicaid program will pay for some assistive technology. Keep in mind, though, that even when Medicaid does cover part of the cost, the benefits usually do not provide the amount of financial aid needed to buy expensive pieces of equipment, such as power wheelchairs. To find out more about Medicaid in your state, call the toll free number for your state. A list of toll free numbers can be found at the following website: http://www.cms.hhs.gov/medicaid/allStateContacts.asp.

In Idaho, the Department of Health and Welfare offers a number of ways to pay for assistive technology. Durable medical equipment (DME) can be purchased under Idaho Medicaid State Plan or through a number of “waiver” programs. Under Idaho’s Medicaid State Plan, DME is purchased based on the definition described above. Assistive technology can also be purchased under any of the state’s waiver programs. Most individuals would be eligible for assistive technology services under the Development Disabilities waiver program and the Aged and Disabled waiver program. For additional information about Idaho Medicaid programs, call the Idaho 211 CareLine.

Idaho Division of Vocational Rehabilitation

The Idaho Division of Vocational Rehabilitation’s program goal is to place Idahoans with disabilities into the workforce by securing and maintaining productive employment. IDVR can provide the services required to assist you to go to work and can assist you in locating suitable employment. Only services that you need to reach employment will be provided. Services to individuals may include:

- Vocational guidance and counseling for adjustment to disability, vocational exploration, and planning for entry or re-entry into the world of work.
- Assessment to determine vocational strengths and weaknesses to plan for services required to reach the employment outcome.
- Training for those who need a career change because of disability. Such train-
ing can involve higher education, on the job training, vocational-technical training, etc.

- Tools and licenses can be provided, if needed, to enter a specific trade or profession.
- Medical assistance can be provided, if needed, to secure or maintain employment and it is part of a comprehensive rehabilitation plan.
- Job development and placement involves you and your Vocational Rehabilitation Counselor working together to secure employment.
- Rehabilitation Technology can be provided to assist you in preparation for or placement on the job site.
- Follow-along can be extremely important to ensure that your job is successful. Such follow-along can assist in resolving any job problems that may occur.

For additional information about IDVR, please visit their website at www.vr.idaho.gov or call (208) 334-3390.

**Idaho Assistive Technology Loan Program**

The Idaho Assistive Technology Loan Program is a consumer-directed program funded by both private and public money that is designed to help Idahoans obtain and use the assistive technology they need. The program has been in existence since 1994, thanks to the combined efforts of private individuals, the Idaho Assistive Technology Project, Idaho area banks, and the Idaho Community Foundation. They have come together to provide low-interest loans to Idaho citizens with disabilities for the purchase of assistive technology. The borrower must have a disability or be acting on behalf of a person with a disability. The loan purpose must be for the acquisition of assistive technology to be used by the person with the disability to increase, maintain, or improve functional capabilities. Loans for assistive technology are available for up to $10,000. Vehicle loans are not covered under the present loan plan, but modifications to a vehicle for assistive purposes can be covered by the loan program. Vehicle loan amounts are based on KeyBank/Zions Bank traditional auto loan programs.

**CONTACT:**

IATP Loan Program
129 W. Third St.
Moscow, ID 83843
1-800-432-8324
(208) 885-3628 fax
Veterans Affairs

Individuals who are eligible for veterans’ benefits may qualify to receive assistance from the Department of Veterans Affairs (DVA). Many people consider the DVA to have a model payment system for assistive technology because the agency has a structure in place to pay for the large volume of equipment that it buys. The DVA also invests in training people in how to use assistive devices. For more information about DVA benefits for assistive technology, call the VA Health Benefits Service Center toll-free at 1-877-222-VETS or visit the department’s website at: http://www.va.gov/health_benefits/.

Private Health Insurance

Private health insurance and out-of-pocket payments are two other options for purchasing assistive technology. Out-of-pocket payment means that you buy the assistive technology yourself. This is affordable for small, simple items such as modified eating utensils, but most people find that they need financial aid for more costly equipment. Typically, private health insurance does not cover the full price of expensive devices such as power wheelchairs and motor scooters.

Subsidy programs provide some types of assistive technology at a reduced cost or for free. Many businesses and not-for-profit groups have set up subsidy programs that include discounts, grants, or rebates to get consumers to try a specific product. The idea is that by offering this benefit, the program sponsors can encourage seniors and people with disabilities to use an item that they otherwise might not consider. Obviously, elderly people should be careful about participating in subsidy programs that are run by businesses with commercial interests in the product or service because of the potential for fraud.

Remote control with simple buttons
WHERE CAN I GET MORE INFORMATION ABOUT ASSISTIVE TECHNOLOGY?

Idaho Assistive Technology Project

Information and Referral

1-800-IDA-TECH. The Idaho Assistive Technology Project (IATP) maintains a statewide information and assistance program related to assistive technology. A telephone consultation is available, as well as handbooks, catalogs, informational fact sheets, videos, and DVDs describing assistive technology devices and services, at no charge to Idahoans. Visit www.idahoat.org/iatpproducts.htm to view information concerning available products.

Training and Technical Assistance

Due to its affiliation with the University of Idaho, the Idaho Assistive Technology Project has access to the staff and resources necessary to help meet your assistive technology training needs. The IATP regularly holds “for credit” workshops, makes presentations to individuals and organizations, provides a variety of online trainings, and offers ongoing technical assistance throughout Idaho.

Assistive Technology Demonstration Centers

The Idaho Assistive Technology Project has established regional centers throughout Idaho that provide assessment, consultation, and information services. Examples of assistive technology may also be borrowed from these centers to try in the home. The Demonstration Centers are listed below:

United Cerebral Palsy
5420 W. Franklin Rd., Suite A
Boise, ID 83705
1-888-289-3259

Coeur d’Alene Hand Therapy and Healing Center
2448 Merritt Creek Loop
Coeur d’Alene, ID 83814
(208) 664-2901

LIFE, Inc.
2110 S. Rollandet Ave.
Idaho Falls, ID 83402
(208) 529-8610
As s i t i v e te c h n o l o g y f o r in d i v i d uAl s w i t h co g n i t i v e im p Ai r m e n t s

Idaho Assistive Technology Reutilization Project

The Idaho Assistive Technology Reutilization Project is a federally funded program designed to establish a system in Idaho for receiving, repairing, and distributing quality used equipment to older persons and Idahoans with disabilities of all ages. There are many individuals in Idaho who do not have the resources to acquire the assistive technology they need to live independently. The aim of the Reutilization Project is to provide consumers with the assistive technology they need to live full and productive lives.

The Reutilization Project accepts donations of used devices such as walkers, wheelchairs, communication devices, computers, and many others. When devices are donated to the program, they are sanitized, repaired, and restored to good working condition. The devices are kept at regional offices throughout the state. In many cases, arrangements can be made to deliver or ship the equipment to consumers at no charge.

Visit www.idaho.at4all.com to see a list of devices available through this program. This program is operated in partnership with the Living Independence Network Corporation (LINC) and many other organizations throughout Idaho.

Advocacy Services

Through a collaborative effort with Comprehensive Advocacy, Inc. (Co-Ad), the Idaho Assistive Technology Project can refer individuals to obtain advocacy and legal services related to assistive technology. To contact Co-Ad, Inc., call 1-866-262-3462 or visit http://users.moscow.com/co-ad/default.htm.

Other Resources

Organizations and Governmental Agencies

Aging Services

Some Area Agencies on Aging (AAA) have programs or link to services that help older people to obtain low-cost assistive technology. Call the ElderCare Locator at 1-800-677-1116 or visit the website www.eldercare.gov to locate your local AAA office. The Idaho Commission on Aging is another helpful resource. Call them at 1-877-471-2777 or visit www.idahoaging.com. In addition, local civic groups, religious and veterans’ organizations, and senior centers may be able to refer you to assistive technology resources.

The Rehabilitation Engineering Research Center on Technology for Successful Aging

The primary focus of the Rehabilitation Engineering Research Center is to promote independence and quality of life for older people with disabilities
through technology - devices that can make everyday tasks easier to complete. Visit its website at www.phhp.ufl.edu/centers/erc.htm.

Rehabilitation Engineering and Assistive Technology Society of North America (RESNA)

RESNA is an interdisciplinary association for the advancement of rehabilitation and assistive technologies (AT). To contact, call (703) 524-6686 or visit www.resna.org.

Coleman Institute at University of Colorado

The Coleman Institute's mission is to catalyze and integrate advances in science, engineering, and technology to promote the quality of life and independent living of people with cognitive disabilities. To contact, call (303) 492-0639 or visit www.colemaninstitute.org.

Institute for Cognitive Prosthetics

The Institute for Cognitive Prosthetics provides information about technology to assist people who are recovering from stroke and brain injury. The organization’s website includes PDF format reprints of research articles. To contact, call (610) 949-9190 or visit www.brain-rehab.com.

The Alliance for Technology Access

The Alliance for Technology Access (ATA) is the national network of community-based resource centers, developers, vendors, and associates dedicated to providing information and support services to children and adults with disabilities, and increasing their use of standard, assistive, and information technologies. To contact, call (707) 778-3011 or visit www.ataccess.org.

Websites

AssistTech.net

AssistTech.net is a national public website on assistive technology (AT) that offers extensive up-to-date assistive technology and disability-related resources, including in-depth AT reports, as well as four easy-to-use search features to find assistive technology to meet your needs. AT manufacturers and vendors can register for free to add their products to the assistivetech.net database.

DisabilityInfo.gov

This site is designed to serve as a “one-stop” electronic link to an enormous range of useful information to people with disabilities and their families.
### Vendors

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<tr>
<th>Company</th>
<th>Phone Number</th>
<th>Website</th>
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<tr>
<td>AbleLink Technologies, Inc.</td>
<td>(719) 592-0347</td>
<td><a href="http://www.ablelinktech.com">www.ablelinktech.com</a></td>
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<tr>
<td>Alzheimer’s Store</td>
<td>(800) 752-3238</td>
<td><a href="http://www.alzstore.com">www.alzstore.com</a></td>
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<tr>
<td>Attainment Company</td>
<td>(800) 327-4269</td>
<td><a href="http://www.AttainmentCompany.com">www.AttainmentCompany.com</a></td>
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<tr>
<td>Dunamis, Inc.</td>
<td>(800) 828-2443</td>
<td><a href="http://www.dunamisinc.com">www.dunamisinc.com</a></td>
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<tr>
<td>Harris Communications/EZ Living Aids</td>
<td>(800) 825-6758</td>
<td><a href="http://www.harriscomm.com">www.harriscomm.com</a></td>
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<td><a href="http://www.ezlivingaids.com">www.ezlivingaids.com</a></td>
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<tr>
<td>ISAAC (Cogent Systems, Inc.)</td>
<td>(888) 679-6378</td>
<td><a href="http://www.cosys.us">www.cosys.us</a></td>
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<tr>
<td>LS &amp; S</td>
<td>(800) 468-4789</td>
<td><a href="http://www.lssproducts.com">www.lssproducts.com</a></td>
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<tr>
<td>Learning Services</td>
<td>(800) 877-9378</td>
<td><a href="http://www.learningservicesus.com">www.learningservicesus.com</a></td>
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<tr>
<td>MaxiAids</td>
<td>(800) 522-6294</td>
<td><a href="http://www.maxiaids.com">www.maxiaids.com</a></td>
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<tr>
<td>North Coast Medical’s Functional Solutions</td>
<td>(800) 235-7054</td>
<td><a href="http://www.BeAbleToDo.com">www.BeAbleToDo.com</a></td>
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<td>Radio Shack</td>
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<td><a href="http://www.radioshack.com">www.radioshack.com</a></td>
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<tr>
<td>Riverdeep</td>
<td>(888) 242-6747</td>
<td><a href="http://www.riverdeep.net">www.riverdeep.net</a></td>
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### ABLEDATA.com

ABLEDATA is a federally funded project whose primary mission is to provide information on assistive technology and rehabilitation equipment available from domestic and international sources to consumers, organizations, professionals, and caregivers within the United States.

### Publications

**Doodads, Gadgets, and Thingamajigs**

This publication provides information on the many uses of assistive technology. It also provides a list of possible resources. ([http://www.ndipat.org/products/dodads/ddtoc.htm](http://www.ndipat.org/products/dodads/ddtoc.htm))

**Solutions: Assistive Technology for People with Hidden Disabilities**

This resource guide provides information on adapted devices for people who have memory problems. ([http://www.uiown.edu/infotech/Solutions.pdf](http://www.uiown.edu/infotech/Solutions.pdf))
REFERENCES


The Idaho Assistive Technology Project provides assistive technology assessments, a low-interest loan program, a used equipment exchange, assistive technology fairs, and community outreach presentations across the state of Idaho.