Assistive Technology for Persons with Developmental Disabilities

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Center of Excellence
Assistive Technology for Persons with Developmental Disabilities

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Lesson 1 -- What is Assistive Technology?

This lesson will introduce you to assistive technology and help you become acquainted with several examples of assistive devices and what they are used for. It will also help you become familiar with several resources for information about assistive devices. There are two assignments for this lesson that will give you the opportunity to search online databases for additional information about specific assistive devices.

Depending on how easily you navigate the web (or how lucky you are), each assignment should take about 30 minutes to complete. There is more detail about the assignment at the end of the lesson.

Defining Assistive Technology

Assistive technology (commonly referred to as AT) describes a broad range of devices, tools, gadgets, machines, and systems that help an individual overcome the limitations of a handicap. In general, AT devices are tools that extend a person's independence. They differ from medical technology (such as a kidney dialysis machine) in that they are not necessarily designed to sustain life. Instead, they are designed to add quality to life.

As a rule, assistive devices are tools or machines that specifically help an individual overcome the limitations of a handicap or disability. In the interest of simplicity, however, this definition is not usually extended to such common items as hearing aids or eye glasses.

On the other hand, there are many common objects that we all use that can be used as assistive devices by a person with a disability, even though that was not what their primary purpose is. For example, a person with limited use of their hands and arms may use an unsharpened pencil as a mouth stick to type on a computer keyboard. In this case, the pencil would be an AT device.

Examples of Assistive Devices

Assistive devices can be used in all sorts of settings to accomplish all kinds of tasks. The table below provides some examples of different kinds of devices, where they might be used, and what they might be used for.
<table>
<thead>
<tr>
<th>Location</th>
<th>Assistive Device</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home (kitchen)</td>
<td>Reacher/grabber</td>
<td>Helps people who are in a wheelchair get things out of the cupboard.</td>
</tr>
<tr>
<td>School</td>
<td>Intelikeys</td>
<td>Provides an alternative keyboard for people with limited use of hands and fingers.</td>
</tr>
<tr>
<td>School - Office</td>
<td>Dragon Dictate</td>
<td>Voice dictation for people who cannot type.</td>
</tr>
<tr>
<td>Home, work</td>
<td>Large button telephone</td>
<td>Helps people who have limited fine-motor control dial the telephone.</td>
</tr>
<tr>
<td>Community</td>
<td>Power wheelchair or scooter</td>
<td>Helps people who have limited mobility get around the community.</td>
</tr>
<tr>
<td>Community</td>
<td>Communication Book</td>
<td>Helps people who don't speak to communicate with others by pointing to pictures.</td>
</tr>
<tr>
<td>Community</td>
<td>Augmentative Communication Device</td>
<td>Helps people who don’t speak to communicate with others.</td>
</tr>
<tr>
<td>Home</td>
<td>Doorbell Lamp Flasher</td>
<td>Helps people who cannot hear to know when the doorbell rings by flashing a living room lamp.</td>
</tr>
</tbody>
</table>

Table 1

As you can see, there are lots of assistive devices. In fact, Abledata, the primer database of assistive devices (you'll learn more about that later in this lesson) lists over 25,000 AT devices. The database is so large it becomes a real challenge for people to find information about assistive technologies. If there is one single barrier that prevents people with disabilities from obtaining assistive devices, it is probably that there is no easy way to get the information needed about the wide range of options available.

Classification Schemes

There are lots of ways to classify AT. For example, you can group devices by what human capabilities they replace or extend. Such a classification scheme, often used in conjunction with Medicaid eligibility, focuses on the disabling condition the device is designed to overcome (e.g., prosthetic devices, artificial limbs, etc.).

Another classification strategy is to group technologies by what they accomplish for the individual. For example, augmentative communication devices help an individual communicate with others. Steering controls are those devices that might be used by a person to control their power wheelchair.

Assistive devices can be classified in terms of whether they are "low-tech" or "high-tech". Low-tech devices are usually very simple tools and have no moving parts or electronic components. High-tech devices, on the other hand, can be extremely complex machines and utilize exotic electrical and mechanical components. As you might expect, low-tech devices are generally more robust than their high-tech counterparts. The more complex a device is, the more prone it is to breakdowns and malfunctions.

Over the past decade, a lot of effort has gone into developing a common taxonomy for assistive technologies. Federal grants have been given to researchers who have worked with engineers, librarians, and members of the disability community to figure out a common means of classifying all of the devices, tools, and gadgets that can be used to assist a person with a disability. Some of these strategies have
worked pretty well. All of them have limitations. Those that seem to be most useful are those that group the technology according to function.

One of the problems with adopting a single classification system is that many devices don't fit just one description. There are many devices that have multiple purposes. In fact, people often put a tool to work doing something that it was never designed to do, but that it does rather nicely. Remember the example of the person using a pencil as a mouth stick for typing on the keyboard? This real-life example worked because the eraser on the end of the pencil didn't slip off the keyboard. In this case, my friend didn't like the paint on the old Ticonderoga yellow pencils, so he had a friend scrape it off. After a while, he found a supply of 'natural' wood pencils that didn't have paint on the outside.

Be aware of the limitations of thinking too narrowly with respect to classification schemes and assistive technologies. When you go searching for information about assistive devices, you may need to use different descriptors from different classification strategies in order to find what you are looking for.

Assistive Technology and the Law

A brief review of the laws that apply to Assistive Technology will help you understand the rights of individuals receiving services as well as the responsibilities of agencies charged with ensuring that individuals with disabilities get AT devices/services.

**Assistive Technology Act (ATA) of 1998** [http://www.mdtap.org/tt/1998.09/lb-art.html] purpose is to increase access to AT devices and services for all individuals with disabilities and those experiencing the effects of aging. This law builds on the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (Tech Act). Some of the services funded for the Interagency Program for Assistive Technology in North Dakota include:

- Regional Technical Assistance: regional coordinators engage in technical assistance activities to reduce barriers and build the support systems necessary for individuals in North Dakota to obtain and use AT devices and services.
- IPAT Equipment Loan Library: lends AT equipment for free trial use.
- IPAT Equipment Expo: traveling equipment demonstration for everyone to explore simple to complex AT devices through demonstration and hands-on opportunities.

**Rehabilitation Act of 1973.** Section 504 requires reasonable accommodation for employees with disabilities, program accessibility, effective communication with people who have hearing or vision disabilities, and accessible new construction and alterations. Section 508 requires that federal agencies ensure that electronic and information technology is accessible.

**Individuals with Disabilities Education Act of 1997 (IDEA '97)** mandates that schools provide AT devices and services to eligible students if needed to accommodate their unique instructional needs. For more information see

- www.ideapolicy.org
- www.cec.sped.org

**Americans with Disabilities Act (ADA)** was passed to increase physical access and provide equal opportunity in the workplace as well as to public services. Reasonable accommodations often
include AT devices that allow individuals with disabilities to be employed and access state and local government services, public accommodations, commercial facilities, telephone, and transportation.

**North Dakota Device Warranty Law (The AT Lemon Law)** was passed to provide a legal avenue for the consumer when they obtain a defective device. This law provides recourse for the purchaser when an AT device is defective or does not meet the person’s needs adequately. For more information see: [http://www.ndipat.org/products/fact/misc/lemonlaw.htm](http://www.ndipat.org/products/fact/misc/lemonlaw.htm)

**Where to get information about AT**

There are several online resources for information about assistive technology. As you might expect, each source has its own features, strengths, and weaknesses. As you explore these sites, you may want to bookmark them. You will be returning to them several times over the next few weeks.

**Abledata** is the primer database of information about assistive technology devices. It contains entries on over 25,000 devices that cover a very wide range. Abledata provides detailed descriptions of each product, how much it costs, and where it can be purchased. The database also provides information on non-commercial products and do-it-yourself kits. Abledata uses a hierarchical taxonomy to group devices. Consequently, it helps if you know something about the device or what you want it to do when you are searching for information. Seasoned Abledata users find that it helps to have some assessment information to guide you as you surf through descriptions of devices. Check out the Abledata website @ [http://www.abledata.com/](http://www.abledata.com/)

**Assistivetech.net** is a relatively new AT information system. It has been developed by the Georgia Institute of Technology and has combined some innovative accessibility tools into the website. Although you may find the information no different than what you might find in another database (such as Abledata), the universal design of the website is really quite good. Check out the assistivetech.net website @ [http://www.Assistivetech.net/](http://www.Assistivetech.net/)

**Closing The Gap** @ [http://www.closingthegap.com/](http://www.closingthegap.com/) is a terrific resource for information about assistive devices for people with severe disabilities. Its website has evolved out of its periodic newsletter and its annual conference. It’s a little cumbersome to navigate, but you will find all sorts of very practical and useful implementations of gadgets to help youngsters with severe disabilities achieve greater independence.

**RESNA** is a professional organization (officially the Rehabilitation Engineering Society of North America) of inventors, engineers, professionals, and consumers who do the AT thing. The official RESNA site @ [http://www.closingthegap.com/](http://www.closingthegap.com/) has many links to a whole world of information about assistive technology. You can find information about conferences, publications, training resources, laws, legislation, and rules and regulations on their website. You may find the resources linked at their AT site especially informative. There are links to dozens of other organizations that provide much more specialized information.

**Interagency Program for Assistive Technology** is dedicated to addressing the needs for and barriers to assistive technology as identified by all people with disabilities in North Dakota, their families, providers and advocates. IPAT's website is @ [http://www.ndipat.org/](http://www.ndipat.org/) Their website includes AT resource information, fact sheets, online publications, links to AT websites, and a used AT equipment "Swap Shop".
Lesson 2: Assessment of AT needs

This lesson will help you develop a working definition of assistive technology. Assistive technology presents many interesting challenges to educators. It is often fallible (computers in classrooms), unreliable (Internet connections), and over-rated (the latest software). AT is even more problematic than most of the technology we encounter in everyday life because it hasn't gone through the multiple generations of design and development.

In spite of these failings, the biggest barrier to finding effective AT devices to increase the independence of people with severe disabilities is the lack of familiarity and awareness about AT options on the part of those who stand as gate-keepers. While AT may not be the best solution for every person's need, it remains our own lack of knowledge that limits the creativity of using technology to help individuals with severe disabilities.

Functional Analysis

One of the terms that you may have encountered in some of the other modules is Functional Analysis. This term is used to distinguish between an assessment strategy used for diagnosis or placement (i.e., a standardized achievement test) and an assessment designed to determine what a person can do (i.e., a vocational assessment). In particular, the functional assessment is a strategy specifically designed to compare an individual's skills against the demands of a particular task. For example, a functional assessment for putting on a coat might include items such as can the woman put her arms in the sleeves and thread and pull the zipper?
When working with people who are using assistive technology, it is important to understand what it is the person wants to do (e.g., open a door), what the device does and how it operates, and what the person needs to do in order to operate it. If the individual lacks the skills necessary to operate the device, it's certain that the device will not meet his or her needs. The key for a successful use of an assistive device or augmentative combination tool is the degree of fit between the person's skill at operating the device to achieve the end goal. Figure A shows a schematic of how these three variables work to achieve independence for the person.

Driving on the Playground

Let's try to put these three variables into practice. Let's say a girl who has severe cerebral palsy wants to increase her interaction with other children on the playground. She may have a power wheelchair, but not have a lot of skills driving it. In this case, the goal is increased social interaction. The device is the power wheelchair, and the skill is driving the chair on the playground. Each one of these items can be examined and assessed as part of the overall assistive technology solution. Each one can break down and cause a failure of the entire solution.

Talking with Friends

Let's try a second example. Sheila has cognitive disabilities (mental retardation) and limitations in her fine motor movement. One of her goals is to communicate with her friends using an augmentative communication device. In this case, team members might want to make sure that Sheila does indeed have the skills necessary to operate the device. While the goal may be appropriate, it won't be a successful solution unless she can operate the device.

Getting a good match between the person and the assistive device is often a matter of trial and error. This cycle of testing, evaluating, and refining is represented in Figure C. Often there are five steps to this process that may be repeated many times:
• Assess the person's abilities and limitations. In this politically correct world, it is often uncomfortable for us to discuss what an individual cannot do. But, it is important to know what the person can and cannot do as you try to find an effective AT solution. It is especially important to define these cans and cannots in terms of functional descriptions. For example, the person may have several disabilities, but the functional limitation may be an inability to hold things in her hand.

• Understand requirements of device. Just as you need to know what the person can and cannot do, you need to know what the device can do. This is especially true for more exotic high end devices such as augmentative communication tools. Some of these devices are not well suited for individuals with certain kinds of disabilities because they are so complicated to use. They may also be unsuited for use in certain environments because they are not portable or because they are fragile. You also need to understand how they operate, how they are programmed, and how they are maintained or serviced.

• Teach skills to use device. Knowing what it takes to operate a device is a logical requirement for teaching the person how to operate the device. In addition to running it, the individual or a staff person, need to know how to program and service the device. It does little to improve independence if the person is dependent on a dealer or technician to maintain the device. Often, staff need to be included in this aspect of the technology plan.

• Assess the person's effectiveness with the device. As the person is learning to operate the device, it will become apparent whether or not the tool is working. If it is too complex to operate, the team may need to devise a more effective teaching strategy to help the person learn to use the device. If members of the team are having trouble figuring out how to program and operate the device, the person with a cognitive disability is going to have difficulty as well. Don't rush to toss a piece of AT without making sure that the person knows how to operate it. In this process, it's important to distinguish between using the AT to learn and learning to use the AT.

• Revise and refine the goal. Finally, it's important to determine whether the AT device is helping the person to achieve their ultimate goal. In some situations, the person and their team may revise and/or refine the goal and repeat the cycle.

Figure C: AT Assessment
Interdisciplinary Assessment

By its very nature, assessment for AT is an interdisciplinary process. Not only will you likely be involving the person with a disability, their family, and agency staff in the assessment; you're likely to involve other professionals as well. For example, you might need the assistance of a speech pathologist or a communications disorder specialist when making some decisions about augmentative communication. You might want information from an occupational or physical therapist when considering a device to improve independence at daily living or mobility. You might also seek the assistance of a technology specialist or computer guru when considering AT.

The interdisciplinary assessment process for AT can become complicated. These difficulties may arise because participants are not familiar with potential options. Team members sometimes come to a planning meeting without having done their homework, without an adequate background in technology options, or they may already have made up their minds about the AT solution before hearing from the rest of the team. So... Here are some suggestions for making the AT assessment process work and making it work well:

- **Do your homework before the meeting.** Follow the steps outlined above and use the information resources listed in Lesson 1 to explore the range of devices that are available. Remember that you will probably have to come back to this step several times during the planning and goal setting process to explore additional options. Your goal should be to identify several devices that might be helpful for the person.

- **Clearly define, and fully understand, the person's goal.** At a minimum, this goal should have a functional definition that describes where, when, and what the person will be doing when the goal is achieved. For example, the team might set a goal for participating in art activities by stating "Sam will use adapted tools to participate in the art activities at the senior center every Thursday."

- **Develop a clear definition of the person's functional limitations.** Most diagnostic terms are not particularly helpful in this task. For example, "cerebral palsy" doesn't tell us much about what the person is unable to do. A more descriptive functional limitation might be something like "Sam does not have the fine motor coordination to hold a paint brush, dip it into a paint jar, or make fine stroking motions on a piece of paper on the desk." or "Sam is not able to fit his fingers into a pair of scissors or operate them". If you have a clear definition of the problem, potential solutions become much more apparent.

- **Develop a clear understanding about what the AT device does, and how it operates.** This is a critical step in planning instruction. If the staff cannot operate the device, they will be unable to teach the person how to use it. You should read the manual and use the device yourself. Some devices come with instructional materials, but these are often only introductory. You may have to create exercises and practice situations so that the person masters the operation and use of the assistive device. Remember that for most people with severe disabilities, learning to operate an
assistive device will require repeated opportunities for systematic instruction. Be sure to plan for adequate instruction and practice.

- **Implement, evaluate, and refine.** Remember that it may take several cycles before the ideal fit is achieved between the person, their goal, and the AT device(s). This is especially true when working with young children who are growing and developing faster than they are mastering their assistive or adaptive technology.

- **Ask about AT at every meeting.** Ask about AT for every goal. Often times it is not the ideal tool, but many times, AT can ultimately increase the person's independence.
Lesson 3: Augmentative and Alternative Communication

Being able to communicate with others is one of the most important skills most of us learn. It is an essential part of our emotional, cognitive, and social well being. It is estimated by the American Speech and Hearing Association that over 2 million Americans are unable to speak well enough to communicate their basic needs. People with these kinds of limitations include those with hearing problems and speech or articulation problems. Disabilities that affect a person’s ability to communicate often lead to secondary disabilities in cognitive, emotional, and behavioral areas.

Augmentative and Alternative Communication (AAC) is the use of assistive devices and strategies to compensate for or augment expressive communication. As was discussed in Lesson 1, there are a host of AAC devices that have all sorts of features (and limitations). They cover a broad spectrum of low-tech to high-tech. There are simple to use AAC devices and there are AAC systems that are among the most complex blends of computers, speech synthesis software, hardware, and heuristics that you’re likely to encounter.

Low-Tech AAC

Examples of Low-tech AAC Technologies include communication notebooks, eye-gaze boards, and continuous loop tapes. There are also a variety of commercially available electronic 'gadgets' that make effective communication aids without additional modifications. Examples of these include everything from talking picture frames to palm computers. Basically anything that the consumer can manipulate to display messages or pictures can be considered an AAC device.

Communication Notebooks. A communication notebook is really nothing more complicated than a notebook or picture album that the individual can manipulate. Naturally, care needs to go into selecting the pictures or messages so that they have meaning and relevance to the individual. For example, you could construct a communication notebook with pictures that relate to the schedule, people, interests, and needs of the individual. Often, the notebook can be made out of plastic photo album pages and can be made small and portable. There is a growing art and science behind the development of the 'vocabulary' of these devices.
Communication Boards. If the consumer is in a wheelchair and has difficulty manipulating pages in a communication notebook, a possible alternative is a combination board which lays the picture vocabulary out on a grid. The individual communicates with others by pointing to the items on the board or by making gestures. Care must be taken in creating the vocabulary for the board. Talk with the individual and their family members in creating the 'messages' for the board.

Eye-gaze Boards. An interesting modification of the communication board is an eye-gaze board which may be effective for individuals who are not able to point or manipulate pages in a notebook. The eye-gaze board is made out of two sheets of plexiglass between which the vocabulary pictures are sandwiched. This board is then placed vertically between the individual and the person with whom they are communicating. The consumer communicates by gazing at the selected item on the board. This system (illustrated in figure A) makes it possible to communicate without losing facial contact.

Continuous Loop Tapes. You might consider using continuous loop tapes if the communication needs can be limited to a handful of short messages. Continuous loop answering machine tapes can be obtained at Radio Shack. Simply record the message on the tape and hook the cassette player up to some kind of switch (more on that latter).

Medium Tech AAC

There are a variety of commercial gadgets that can be adapted for communication aids. Naturally, the individual communication needs of the consumer dictate the message, where the message needs to be delivered, and the means by which the consumer initiates communication. Here are some examples of medium-tech AAC devices you could consider:

Electronic Organizer. Take a few minutes, sometime, and thumb through an electronics magazine. There are dozens of electronic organizers that can be programmed with a variety of short text messages. These are inexpensive, portable, and have tremendous potential for a person, provided that they are able to read and manipulate the keyboard.

Talking Picture Frames. The local discount stores are chock full of gadgets marketed for Mother's Day that can be adapted for AAC. One example is a talking picture frame. The talking picture frame has a small speaker and a chip that can record a short message. This device could be a clever way to combine the best features of a communication board and a continuous loop tape.

Palm Computers. Palm computers have increasing capacity to display text and graphic
messages. They naturally require more sophistication on the part of the user, but they are very portable and extremely versatile.

High Tech AAC

There are a wide variety of high-tech AAC devices. These devices are generally operated by the individual selecting from pre-programmed messages, phrases, or phonetic elements to assemble a message. The message is then spoken using a voice synthesizer.

Generally, there are three types of input: icon-based, phoneme-based or pre-programmed message-based. The icon-based system uses a board with pre-selected icons or pictures (much like a communication board). The user presses these icons to assemble short messages. In contrast, the phoneme-based devices have a touch pad or keyboard that allows the user to assemble messages, sentences, or long paragraphs. Steven Hawking, the noted physicist who has ALS (amyotrophic lateral sclerosis; often called Lou Gehrig's disease), uses a device that has been modified using a switch. A hybrid of these two strategies is a device that simply has a huge dictionary of pre-programmed word or message elements. The user assembles the message by pasting together a string of message elements.

These devices have been evolving significantly over the past decade. You can follow some of the links in the resources section below to review manufacturers' web sites.

Online Resources for Augmentative and Alternative Communication

http://www.prentrom.com/index.html is the link for Prentke Romich Company which distributes a variety of AAC devices and tools.

http://www.familyvillage.wisc.edu/index.html is the link for the Family Village, a tremendous online community of people who have disabilities, their families, and those who work with them. Take a look at the "mall" for links to resources about assistive technology.

http://www.minspeak.com is a link to what will eventually be a nexus for information about minspeak, an icon based semantic compression system. It may not be far along, right now, but it does provide some interesting links.

http://ask.com is a link to a really cool search engine. You just type your question and it goes out and finds sights that will answer it. Try typing in something like.... "What is minspeak?" or "What is Augmentative Communication?"

Assessment and Implementation Issues

The principles of functional assessment discussed in Lesson 2 play an important role in developing an augmentative or alternative communication solution for a person with a disability. A successful assessment in AAC also requires the close interaction of a variety of disciplines including the family, the instructional staff, a speech/communication specialist, possibly an audiologist, and sometimes a physical/occupational therapist. Above all, the approach to determining the consumer's needs, must focus on functional communication. Some questions that you might want to keep in mind include:

- How does this individual currently make his/her wants, interests, and needs known?
- What environments does this individual live and work in?
- What kinds of motor skills does the consumer have that can be used in communicating (i.e.,
operating a device)?

- How can communication be crafted so that the consumer has greater independence and control over their environment?

**Input Considerations.** When making initial assessment decisions about AAC strategies, give early thought to how the consumer is going to operate the device or gadget. Family members, instructional staff, and possibly an OT/PT might have ideas about the ability of the consumer to operate a gadget. Remember, the more complex a device, the longer it may take the individual to become skilled at using it. Give some thought to how you are going to teach the consumer to use the device. Obviously, there needs to be immediate benefit and high pay-off for the individual to learn to operate a complicated device. In some cases, it may be better to start with something on the low-tech side before tackling a more complicated device.

**Output Considerations.** Part of the assessment process needs to look at the environments in which the device is going to be used. If these environments are stable and predictable, such as a school classroom or a home, you might be able to use strategies that are more complex and perhaps less reliable. On the other hand, if the output environment is unpredictable, such as the mall or out in the community, you might want to select strategies that are more portable, simple, and easy for others to use when interacting with the consumer.

**Portability.** Some AAC devices and strategies are very portable. For example, a communication book or board can be used by a consumer while out in the community. On the other hand, computer-based AAC devices, an eye-gaze board, or the like, are not necessarily portable, nor are they easy for people in the community to use. If the consumer needs or desires to be out in the community, on the playground, or with people who are unfamiliar with the communication device, you may want to select something that is portable and fairly simple.

**Vocabulary.** By far the most complex aspect of assessing for augmentative or alternative communication is selecting the 'vocabulary' of the device. Almost all AAC devices have limitations on the number of phrases or messages they can produce. This is especially true of the simpler icon or picture based systems such as communication boards or books. There are several icon/picture systems that have already been developed and published. These might be a good place to start. Links to some of these systems are provided below.

**Teaching.** One of the most often neglected aspects of implementing AAC with people who have severe disabilities is the need to teach them how to use the device. Research has demonstrated that the most successful implementations of AAC have happened when someone else (teacher, staff, parent) is tremendously facile at using the device. So the first step in teaching the person to use the device is for the instructional staff to become experts on programming, operating, fixing, and troubleshooting the device. You should also give thought to developing a series of instructional exercises on how to operate and program the device. Often, however, it is not the individual themselves who does the programming or maintenance, but a teacher, staff, or a family member. The team should do cross-training in learning to keep the device operating and helping the person learn to use it.
Lesson 4: Mobility Tools

Being able to move about our environment is important to our health, learning, and independence. Most of us hardly give any thought to navigating around our homes, schools, or communities. We are able to climb stairs, cross a threshold, walk across a snowy parking lot, and get in and out of cars without too much difficulty.

For people with limited mobility, all of these environments present serious challenges. Nearly all people with severe disabilities have some form of related mobility impairment. Their limitations may range from chronic fatigue and mild coordination problems to complete immobility.

There is an enormous range of assistive and adaptive devices to aid mobility. Like the augmentative and alternative communication tools discussed in Lesson 3, these mobility devices range in complexity from canes and crutches to power wheelchairs that have automatic sensors and leveling devices that make it possible to drive the chair up stairs, over curbs, through sand and gravel.

Assessment and Implementation Issues

There are at least four elements that need to work together for a successful AT solution for mobility. Each of these elements are important in their own right, but they must work together when addressing the functional limitation of mobility. Poor solutions in any one of them can cause a failure in the whole AT solution.

Device -- When considering what kind of device to use to assist an individual with mobility limitations, give careful analysis to the environment(s) the person needs to navigate. For example, ask questions such as "Does this person need to get around the community or do they just need to get around home and school?" You might also ask questions about how the person will access other transportation systems such as the public bus, or a family vehicle.
The device can range from something as simple as a cane, a crutch, or walker to a wheelchair, power scooter, or high tech power wheelchair. Each of these solutions has strengths and weaknesses, depending on the needs of the individual and the environment in which they navigate.

**Control Interface** -- The control interface is the means by which the individual operates the mobility device. It is especially important when teaching the consumer to use a power wheelchair or scooter. It should also be considered when making considerations about mechanical devices. For example, hand breaks on walkers or wheelchairs are important safety features, but only if the consumer has the strength to operate them.

Control devices on power wheelchairs often take the form of a joystick. On scooters, the control interface is a handlebar, much like on a bicycle. They often have sophisticated electronics that help adjust the
sensitivity of the steering mechanism. For example, a person with cerebral palsy may have difficulty making the fine motor movements to steer their power chair. The steering joystick may have sensitivity limits to help filter out overcorrections.

**Positioning** -- Care needs to be given to positioning the consumer in the mobility device. In many cases, the individual spends a good part of the day in the wheelchair or scooter. There is a whole science about positioning and seating that needs to be taken into consideration. Not only can a poor seating solution make it difficult for the consumer to operate the device, but it can lead to pressure sores, bone and joint problems, and other health difficulties.

**Maintenance** -- The most over-looked aspect of mobility assistive technologies is their ongoing maintenance. In many cases, these devices cost as much as an automobile. They are often used as much as a car and they need ongoing maintenance. They get dirty and they get beat up running into things. The joints get loose over time, the motor needs periodic adjustment and the tires wear out. Just like a car, they need to be tuned up and taken care of. Naturally, more complex devices need more sophisticated support. In any case, a successful mobility device needs to be easily repaired and a regular program of maintenance needs to be planned.

**Interdisciplinary Assessment**

The proper assessment, monitoring, and fine-tuning of a mobility AT solution involves several disciplines. In addition to the family, the teacher, and the classroom staff, you might work with a physical therapist to help with posture, positioning, and seating. You might have an occupational therapist on your team or a movement specialist to help make decisions about the appropriate control interface. Naturally, the classroom staff and the teacher are going to be involved in making assessments about the types of environments the student is going to want to be able to navigate in and how to go about teaching the student how to operate the mobility tools. Family members are likely to be involved in maintenance of the device and you will probably have a medical doctor (probably a bone and joint doc) to help with medical need. More on that in Lesson 7 about financing purchases of AT.

One of the challenges of mobility AT, especially with children and youth, is that no solution is permanent. Young people, even young people with disabilities, are growing. Consequently, every aspect of a mobility device needs to be monitored and evaluated. This review process should happen at least every month or so.
Resources

Here are some links to online resources about mobility and positioning. Naturally, you can expand your search for relevant links by going to ask.com and typing in a general question. You can also take a look at www.naric.com, a national archive of rehabilitation information.

Wheelchairs, Scooters, and Walkers

- http://www.mogowheelchairsusa.com/

Positioning and Seating Resources

- http://www.aelseating.com/

Other interesting sites from which to launch a search

- http://www.naric.com
  http://www.ed.gov/offices/OSERS/NIDRR/index.html
Lesson 5: Learning Tools

So far, we’ve been learning about using assistive technologies that have broad application at home and in the community. This lesson is going to help you gain a better understanding about the devices that are especially useful at helping people who have disabilities engage in learning.

There are lots of technologies that help people with disabilities learn reading, writing, and arithmetic. Some of this technology is unique to individuals with physical disabilities (pencil grips) while some of it is so intertwined with instructional technology that it could be used by any person (portable keyboards). For our purposes, we will divide this universe of learning technologies into four areas:

- Assistive technologies for accessing computers;
- Assistive technologies for reading;
- Assistive technologies for writing;
- Assistive technologies for managing behavior.

Accessing Computers

In the early 1980s, Greg Vanderheden argued that the personal computer could serve as a platform to which could be attached all sorts of devices and tools to help people with a wide range of disabilities. Since that time, the personal computer has come a long way. Software has also evolved with a variety of “hooks” that can make it more adaptive and assistive to users.

To make the computer accessible to people with disabilities, you need to determine what aspects of the computer are a problem. For example, if the person is blind, you need to modify how the screen communicates to the individual. If the person has motor impairments, you may need to change how the keyboard and mouse operate.

**Screen Readers.** Screen readers are devices or programs that can be loaded onto a PC to literally read the screen to the person. In the past, these devices were a card or a box that attached through a serial port. More recently, the screen reader is simply a program that uses the computer’s existing sound card to play the audio. The voices are typically synthesized and often not particularly sophisticated in how
they deal with words that are phonically irregular. However, this limitation is rapidly improving. Further, some people who are blind can speed up the screen reader so fast that we couldn't make sense out of it, but they have learned how to adapt to it.

Another alternative to the regular screen is a screen magnifier that enlarges the text. These kinds of programs are different than just increasing the font size of a word processing program. They magnify all aspects of the computer screen including the icons, the tool bars, and the command buttons.

**Alternative Keyboards.** There are several ways to adapt a keyboard for a person who has motor or attention/learning disabilities. Some of the more simple ways include a keyboard with big keys or with keys that have been laid out in alphabetical order, rather than in the standard QWERTY layout. Another very elegant device is the Intellitkeys keyboard which uses a thin plastic membrane to configure the layout for any arrangement of keys, size and function. This makes it possible to create a unique layout of keys to be any size, number, and function you might want. You can also add macros to the keys so that they actuate a whole series of keystrokes to the computer with a single stroke from the user.

Another common adaptation for keyboards is to run a small program to make the command keys “stick”. In fact, one of these little utilities used to be called “sticky-keys”. This allowed a one-finger typist, or a person using a mouth stick to type, to get keys like the control and alt keys to toggle on and off, much like the Cap-Lock key works. This allows one-finger typists to hit combination key strokes like Control-C or the like.

**Alternative Mice.** Similar to alternative keyboards are alternative mice. In addition to modifying the mouse so that it can be grasped by someone with a physical disability, some folks swap the standard mouse for an alternative pointing device. Pen-shaped mice or a digitizing tablet are more akin to working with a clip board. There are a whole host of physical adaptations that can be used with these devices to help a person hold, grasp, and manage mouse movements. More exotic mouse alternatives include pointer devices that are attached to the head or eye glasses of the computer user.

**Mainstream (Microsoft) Accessibility Options.** Universal design (and a very active disability community) have challenged, threatened, and encouraged the developers of commercial software to build accessibility into their programs. Some have responded well and we are seeing gradual developments that make all operating systems and application programs more accessible. Where you used to have to purchase a bunch of adaptations individually, many of them are being built into the operating systems and application programs from the beginning. For example, Windows 2000 comes with a set of accessibility features that include a built-in screen reader, features to magnify the text on the screen, sticky keys to toggle the shift, control, and alt keys on and off, and a wizard that helps you configure these tools. Because these accessibility tools are built-
into the Windows operating system, they are available in most of the application programs running on many computers.

Switches. Switches can be hooked up to computers through game ports, through alternative keyboards such as Intellikeys, or they can be hooked up through special cards or peripheral devices. They can be used with an emerging set of programs that help people with severe disabilities learn about cause-and-effect relationships and learn to operate software. There is a wide range of switches available. For example, simple toggle on/toggle off switches require the person to hit the switch to turn it on and then hit it again to turn it off. Another switch might be designed to be on as long as the person holds the switch down.

Switches can be mounted to a wheelchair, desk, bed, or whatever. They can be placed near any part of the body and can be actuated by any body movement that the individual has reliable voluntary control over. Switches can be modified with large plates or with enlarged buttons. You can also obtain leaf switches that operate by bending a piece of metal that can be operated by a slight movement of the head or chin. Eye-blink switches work off of a twitch of the eyelid while sip-and-puff switches work off of a straw that the person puts in their mouth.

Switches can be interfaced with computer software. The software may display a scanning table on the screen and the individual uses the switch to move a cursor through a set of options to select letters, build words and sentences, and do word processing. The switch may also be hooked up to other devices such as a power wheelchair, a game, or a toy.

There is no single right switch for every setting. It often takes some experimentation to find a switch that works well for the person and the particular application. In addition to how the switch operates, it is advisable to carefully evaluate the positioning and the mounting of the switch. There is a whole range of tools, devices, and mounting hardware to help with this task. You will likely need to work with an occupational therapist or a physical therapist to make these decisions, but it will require constant tinkering, experimenting, and testing to help the person get the most out of switch use.

Reading

Reading is the most complex cognitive task we learn. Next to speaking, it is probably the most important because it provides the gateway to other learning opportunities. Individuals with disabilities have two limitations to reading. The first is the learning part. The second is the reading part. We’re going to skip the learning part. People make their careers developing reading curriculum and you can learn about effective reading instruction elsewhere. We are going to talk about the reading part and the assistive technologies that help people manipulate, manage, and deal with text.
Managing Paper. We live in a paper-print world. While lots of text is available in electronic formats, the vast majority is still only available on paper. Individuals who have difficulty manipulating books, newspapers, letters, and other forms of printed materials are cut off from important information streams. Assistive devices that help individuals manage paper include page turners and page magnifiers. Books on tape, books for the blind, and books on disk are other alternatives as well.

Books on Disk. With some of the computer accessibility strategies described in the previous section, books on disk or electronic texts can be accessed through a variety of adaptive software. For example, you can use a screen reader to recite the text of a book or text file. The nice thing about the digital books is that the user can back up, jump ahead, or repeat sections of the text, rather than just listening to the recitation in a linear fashion as it is read from a tape.

Project Gutenberg is a resource that everyone ought to be familiar with. It is an effort to transfer a significant amount of the world’s literature to ascii text files that are available over the Internet. You can learn more about this project by going to any search engine on the Internet and following the related links.

Writing

Like reading technologies, assistive devices for helping people write can be divided into those designed for paper and those designed for computer. They can also be divided into those designed to help person learn to write and those designed to help with the mechanics of writing. For our purposes, we will focus primarily on those devices that help with the mechanics.

Putting Words on Paper. Assistive technologies that help people grasp and manipulate a pencil and paper are widely available. For example, pencil grips, wrist straps, and modifications to desks or clipboards might be considered in helping an individual be able to write and turn pages. You might work with an occupational therapist in identifying devices and strategies in this arena.

Writing with the Computer. In addition to the alternative keyboards and adaptive software that you might use on any computer, there are some unique adaptive devices that are especially relevant to writing with the computer. For example, many keyboards can be programmed with macros that map a whole series of key strokes onto one key. Thus, you could program a F9 key to launch the word processor, open a new file, call up a template that includes the date, types “Sincerely Yours,” hits four returns, types the person’s name, goes back up to the top of the documents, types “Dear”, and then waits for the user to start typing the letter.
*Word Prediction Software* is used in conjunction with word processing programs. It is especially useful for one-handed or one-finger typists. It is also useful for people with learning or cognitive disabilities.

These programs work in the background monitoring the word the person is typing. As each letter is keyed, the program analyzes the syntax of the sentence, looks in the dictionary, considers what words the person has typed before and displays a menu of words. If the person wishes, he or she may simply select the word from the menu, rather than typing it out all the way. An example of this kind of software is Co:Writer which also features a screen-reader. Co:Writer is available in PC and Mac formats.

*Voice Dictation software* is also a possibility to help people write. Programs such as Dragon Dictate, Via Voice, and others are available at almost any office supply store. These programs work in combination with a word processing program. The individual speaks into a microphone and words are translated into text. The person can also use verbal commands to move the cursor around and edit the text.

Voice dictation programs have had dramatic improvements over the past few years. They are widely available in most office supply stores and are really quite reasonable in terms of cost. However, they are not fool-proof. Often, if a person cannot read well and does not have outstanding concentration skills, they are not likely to find voice dictation a useful adaptation. Most programs still require substantial training and monitoring to get the recognition rate above 95%. Further, the process of editing can be tedious.

**Behavior**

Among the most challenging things about your job is providing positive behavioral support. Although the science behind behavioral intervention is well established, our ability to systematically implement behavior programs is often sketchy at best. Although not in wide use, there are some assistive devices that may have application in helping to support behavior change.

**Naggers.** They are basically fancy stopwatches that can be programmed to provide a text prompt about what needs to be done at a certain time. Originally developed to help prompt a person when it was time to take medication, these devices can be used to prompt either the person, staff, or parent, when some element of a behavior program should be conducted. For example, a behavior program may require that data be recorded and reinforcement be administered at a certain time every few hours. These stopwatch devices can be programmed to beep and prompt the person or the staff to perform the required action.
Software is available or can be adapted for most Palm devices to do the same thing. Also, some wireless pagers can be set up to do a similar task. The advantage of these devices over a stopwatch is that more extensive text or graphics could be incorporated into the prompt. Palm devices could also be programmed to allow data recording.

**Assessment and Implementation**

AT should be considered at every team meeting. Team members should discuss whether or not assistive technology might be an appropriate means by which each goal might be achieved. Over the past decade, each state has had a statewide assistive technology project that has helped to address the policy and procedural issues by which assistive technology is considered. In many instances, these projects have helped develop resource materials for parents, consumers, educators, and agency personnel and provide training upon request.

The assessment of the individuals with disabilities is an interdisciplinary process. Assistive technology possibilities can be included at several steps along the way as the assessment process unfolds. In general, however, it is probably best to make it an explicit part of the assessment procedures. Otherwise, it is likely to get overlooked.

As we discussed in an earlier lesson, successful assessment and implementation of an assistive technology solution depends on a good match between a person's need and the device. This match up depends on somebody on the assessment team being familiar enough with a range of possible technology devices to consider them.
Lesson 6: Aids for Independence

Independence

This lesson will help you learn more about a large group of assistive devices that are aids for every-day living. Disabilities often place limitations on an individual's ability to do things for themselves. Hence, they become dependent on other people to do things for them. Their independence becomes limited. Assistive technology, while it is rarely a 100% satisfactory solution, increases an individual's independence by letting them decide when, where, and how they do certain things.

There are lots of ways that aids for independence can be classified. As we noted in an earlier lesson, a lot of work has gone into designing classification schemes. This lesson is only intended to introduce you to this interesting class of assistive devices. While there are potentially thousands of devices that can aid an individual's independence, we will look at examples that are useful in three home locations: the bathroom, the bedroom, and the kitchen.

The Bathroom:

We all spend a lot of time in the bathroom. We bathe, groom, and take care of personal hygiene in the bathroom. Here are some assistive technologies that people with a variety of disability related limitations might find useful in the bathroom:

- **Elevated toilet seat**: People with mobility impairments have difficulty using the toilet. Transferring in and out of the wheelchair or using crutches makes it difficult as well. Elevated toilet seats may make this process easier. Handles and support bars should also be considered in bathroom settings.

- **Commode (an alternative to the toilet)**: For some individuals and in certain settings, a portable commode is a better alternative than modifications to the regular toilet.
**Shower chair:** Getting a shower or a bath is difficult for a person with a mobility impairment. Shower or bath chairs in combination with a hand held shower can increase an individual's independence with respect to bathing and personal grooming.

**Transfer bench/chair:** Transferring in and out of a bathtub is difficult for many people who have mobility limitations. Transfer benches or transfer chairs can be a low-cost adaptation to increase an individual's independence in the bathroom.

**Transfer bar for tub:** A transfer bar or a support bar in the bathtub can also be a low-cost adaptation to increase an individual's independence and safety while bathing.

**Grooming aides:** Minor modifications to everyday grooming tools can help an individual have control over their personal care and hygiene.

**The Bedroom:**

Assistive technologies that may be helpful in the bedroom include those that help an individual dress themselves and get in and out of bed. Here are some examples:

**Button or zipper puller:** This handy little device makes it possible for those with limitations in fine motor coordination button shirts and zip zippers.

**Sock or stocking puller:** This handy tool makes it possible for a person to put their socks on without bending their legs. You can even use this to put your socks on if you can't reach your toes.
Bed rope ladder: Here's a clever device to help a person sit up in bed. It might be useful in getting in and out of the bed as well.

Bed rail: a bed rail is helpful for a person with limited strength or mobility transfer in and out of the bed. This one even has a handy place for books, magazines, homework, or a TV remote.

The Kitchen

We prepare meals, eat food, and do the dishes in the kitchen. Here are some assistive devices that can increase an individual's independence in the kitchen:

Alternative Door Knob. Door knobs must have been designed by idiots. Anybody with arthritis, fine motor limitations, or a bag full of groceries is going to have difficulty operating an American doorknob. There are a variety of adaptations for traditional doorknobs to turn them into handles that are much easier to operate. Most don't cost more than a few dollars.

Jar opener. This jar opener is simply a piece of rubber that helps a person with limited hand strength get leverage to open the lid of a jar.

Reachers. Reachers are kind of like robot arms that make it possible for a person who is in a scooter or chair reach and grab something that is on a shelf or in a cupboard without having to stand up.

Adapted Silverware. There are all sorts of modifications that can be made to silverware to make it easier to hold so that a person can eat without assistance.
Adapted Plates and Dishes: These are dishes that have edges or lips that a person with limited coordination or strength can use to help push food onto the silverware so that they can eat without assistance.

Nosey Cups. People that have difficulty swallowing or getting food into their mouths because of coordination problems find these cups handy. They have a place for your nose to go so that you can get the drink into your mouth, rather than dribbling all over the place.

Assessment and Implementation

Assistive technology solutions should be considered when addressing grooming, eating, personal care, and hygiene goals. The team could include assessment strategies to determine the person's proficiency at using the device and generalization of the use of technology to other settings. The single biggest complication about implementing assistive technology for independence is the perception that it is expensive. There is no doubt that these assistive devices and adaptive aids do cost money. However, their cost is much less than is generally assumed. In fact, very few of the items used as illustrations in this training manual cost more than a hundred dollars. Cost should not be used as an excuse for not providing access to adaptive technologies appropriate for increasing independence.

Where To Go For More Information

Take a look at the following sites for information about assistive and adaptive technologies to aide independence in daily living:

Maddock @http://www.maddak.com/: markets adaptive devices for individual independence.

Ablephone @http://www.ablephone.com/: markets devices to make telephones accessible.

Yahoo's Adaptive Tech Site One of many Yahoo directories of assistive and adaptive technologies.
@http://dir.yahoo.com/Business_and_Economy/Shopping_and_Services/Disabilities/Assistive_Tecl:

Accessibility Products @http://www.accesstoday.com/: Markets resources for independent living.
Lesson 7: Funding Communication and Assistive Technology

Funding AT

For most of us, the single most intimidating aspect of assistive technology is not its complexity or figuring out how to make it work, it’s figuring out how to pay for it. There is no question that assistive devices cost money, sometimes a lot of money. Further, the "return" on the dollar for assistive technology is not always easy to see. In spite of these challenges, funding the purchase of assistive and adaptive devices need not be the hurdle that it often is. Here are some things to keep in mind about purchasing assistive technology in general:

- The vast majority of adaptive devices and assistive technologies cost less than $50 a piece. Even in the workplace, most technology accommodations cost less than $200.
- While some assistive devices always seem like they are obsolete because a new and better model is just coming out, it is in reality no worse than personal computer technology. In fact, even the most exotic assistive devices such as augmentative communication devices have service lives that outlast most expensive office computers.

Potential Funding Sources

Over the past few years, the number of agencies that provide funding for assistive technology has expanded, but their application procedures have become increasingly specialized and targeted. There is no way that an introductory training manual such as this is going to provide enough detail to guide you through all the requirements of the many funding resources available for assistive technology. The intent here is simply to acquaint you with some of the funding options that might be available to you.

Here are some of the agencies and programs that you might consider approaching for funding or assistance in securing funding. Bear in mind that each program has specific requirements that you may need to address in order to qualify for their funding.

Schools -- Schools are required to provide appropriate assistive technology to students who have disabilities if it is needed for their education. The technology must be included
in the student’s IEP (individualized education program) and deemed a necessary accommodation by the student’s IEP team.

**School-to-school** -- Schools may want to enter into agreements with other school districts or special education programs to transfer equipment as needed. This may be especially important for students as they move from one school to another or transition from elementary to secondary schools. Schools may also want to establish loan agreements with one another so that they can borrow equipment that is no longer being used.

**Vocational Rehabilitation Program** -- The state Vocational Rehabilitation Program often plays a significant role in the lives of adults with disabilities who are working. The VR program provides information, assessment, training, and funding for assistive devices to help people with disabilities work and live independently. Generally, VR funding is not used for devices or technologies that are experimental or are not specifically related to individual independence at home or in the work place. Other services under Vocational Rehabilitation that may fund AT include:

- Supported Employment Program - This program can fund AT related to employment of adults with the most severe disabilities.
- Services for Older Blind - Funds AT for individuals who are 55 years of age or older and because of their blindness or severe visual impairments, gainful employment would be extremely difficult to attain, but for who independent living goals are feasible.
- Independent Living Services - North Dakota’s four Independent Living Centers (Minot, Grand Forks/East Grand Forks, Fargo/Moorhead, Bismarck/Dickinson) provide telecommunication services and devices to individuals with speech, hearing, and physical impairments that will allow them to communicate with family, friends, employers, and services. No other funds are available specifically for the purchase of assistive technology, but this program can offer services which support and increase access to AT.
- Interagency Program for Assistive Technology (IPAT) - IPAT does not provide AT funding but does provide technical assistance to systems responsible for the provision of AT. It operates an equipment loan library, provides advocacy services, and AT training and technical assistance for individuals with disabilities and service providers.

**Medicaid** -- Medicaid is a health insurance program funded jointly between the state and federal governments. It covers the costs of some assistive devices if they are considered medically necessary. Specific guidelines for mobility, communication, and aids for independence often require the certification of a physician in collaboration with an occupational or physical therapist. Certain conditions must be met before Medicaid funding can be accessed.

**Medicare** -- Part B of the Medicare program provides coverage for some types of durable medical equipment if they are considered to be medically necessary. In general, these types of durable devices are going to be used in the person’s home.
Private Insurance -- Depending on the individual policy, some types of private insurance may purchase equipment. In general, the types of assistive devices that qualify for purchase under most private insurance programs must be considered 'medically necessary' and will thus require a doctor’s certification. Further, private insurance must have been accessed before funds from Medicaid and Medicare can be obtained.

Non-profit Disability Associations -- A variety of local, state, and national non-profit disability associations have programs to help people purchase, borrow, or obtain loans for assistive devices. Some of the organizations that have established consumer assistance programs include: North Dakota Association for the Disabled, United Cerebral Palsy Association, the March of Dimes, the Muscular Dystrophy Association, Easter Seals, Federation for the Blind, Multiple Sclerosis Society, ALS Society. In addition to the national associations, there are state and local chapters of these and other organizations that may be of assistance in obtaining assistive technologies.

Service Organizations -- In addition to disability-specific organizations, there are many local, state and national service organizations that have programs to assist individuals with disabilities obtain assistive devices. Some of these community service organizations include: Lions Club, Sertoma Club, Kiwanis, Shriners, Veterans of Foreign Wars, and the Optimists Club.

Loan Libraries -- In North Dakota, disability service agencies and advocacy programs have established loan/demonstration libraries where people can obtain assistive devices on a trial basis. Check with your local special education program or your local independent living center for more information about any loaning libraries in your community.

Revolving Funds -- Some states and communities have established special loan programs with local banks to help consumers obtain low-interest loans for purchasing assistive technologies. Check with your local independent living center or Vocational Rehabilitation office for more information about what is available in your community.

Foundations and Trusts -- The Otto Bremer Foundation, Christopher Reeves/Paralysis Foundation, Muscular Dystrophy Association, and the Multiple Schlerosis Foundation are examples of private foundations that may fund AT.

This list is by no means exhaustive. Further, each of these organizations is going to have its own priorities and procedures. In all likelihood, it may take a couple of tries before funding will be obtained. One of the cardinal rules about funding assistive technology is that “No” does not mean “no”!
AT Key Newsletter - Bi-Monthly from 1996 to Present

A Guide to Policy and Funding for AT in North Dakota 2001

IPAT Training Modules

AT Key Information Fact Sheets

A Picture of Assistive Technology Use in North Dakota

Doodads, Gadgets, and Thingamajigs

IPAT Brochures

AT Trigger

Program Analysis for AT (PAAT)

IPAT Video Resource Library Directory

AT Planning Guide (Technology for All: A Guide to Solving the Puzzle)

Statewide Surveys

North Dakota AT Technology Program (IPAT) Video

North Dakota Medicaid Coverage Policy for Augmentative & Alternative Communication Devices & Services

Public Forums

Solutions: Assistive Technology for People with Hidden Disabilities

Information Technology Accessibility
Any of the training modules can be purchased at a cost of $25.00. To purchase your training module contact the IPAT office by calling 1-800-265-IPAT (4728), or 1-701-265-4807 Voice/TDD. or e-mail IPAT

Technology for All: A Guide to Solving the Puzzle

Technology for All: A Guide to Solving the Puzzle provides the pieces that fit nine critical components together for a comprehensive technology plan. These components can comprise a stand-alone assistive technology plan or can be integrated within a system’s overall technology plan. It is intended for use by school systems, rehabilitation centers, and other entities providing direct services to people with disabilities. This module compliments the book Technology for All: A Guide to Solving the Puzzle. A book is included with the module as part of the purchase price.

Funding Communication Devices through Medicaid of North Dakota

This module will define the conditions under which Medicaid of North Dakota accepts responsibility for funding communication devices (augmentative/alternative communication devices), including Medicaid’s purpose, the scope of coverage, assessment/data reporting procedural requirements, and review criteria.

Assistive Technology for Individuals with Learning Disabilities

The following module provides:

- a rational for the use of assistive technology for individuals with learning disabilities
- a functional and legal definition of assistive technology
- an overview of assistive technologies currently available to support individuals with learning disabilities in the areas of written language, reading, listening, and mathematics; and
- information on how to select and evaluate the various assistive technologies currently available.

This module is intended for anyone interested in better understanding the potential assistive technology (AT) has to compensate for specific learning disabilities.

AlphaSmartà: Inexpensive, Portable Input Device
This module provides an overview of the AlphaSmartâ, including features, tips, and tricks in using it to complete a variety of writing tasks. Emphasis is placed on matching features for individuals with disabilities.

Assistive Technology Assessment Process

This module provides a description of the steps involved in matching the capabilities and needs of an individual to the characteristics of an assistive technology system.

Basic Computer Technology

This module provides an overview of the basic structure of a computer system. It provides basic essential information on major hardware issues. It is intended for the individual new to computing who may find themselves in a position on needing to deal with hardware related issues, from selection, troubleshooting, instruction and more.

Adaptive Computer Access: Inputs and Outputs

This module provides an overview of types of adaptive software, adapted keyboards, mouse alternatives, and computer output methods accommodating a variety of disabilities. It provides a basic review of how various types of adaptive devices work with different computers.

Environmental Control Systems

This module provides an overview to the different types Environmental Control Systems, which are available to control different tasks within an environment. The module will look at different signals used to control devices throughout the environment and devices used to control these signals. It will also look at low to high tech control systems.

IPAT Home