AT-Info-Map

Assistive Technology Guide

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What is Assistive Technology (AT)?

Assistive technology devices are anything that can be bought, made or changed to maintain or improve the functioning of people with disabilities (PL 108-364, Sec 3, d, 3). AT can support persons with disabilities to work, learn, play and live in their communities.

For example, because most people can see with their eyes, the human-built environment is designed in such a way that people who are blind or have low vision need AT to allow them to make sense of the world around them. They might, for instance, use a smart phone to read signs that are only visual (i.e. not in Braille), use a screen reader to read information from a computer, or use a tactile map to understand the layout of a building.

There are many types of AT. The International Organization for Standardization (ISO) differentiates between 12 classes and 945 titles of AT types according to the function of the product (e.g., AT for communication, mobility, recreation and leisure). Within each title, there could be many examples of specific products produced by different manufacturers. AT can also be classified in other ways (e.g., AT for specific functional differences like impairments in vision, hearing, walking). In this Guide, we have created 17 larger categories for the types of AT that are relevant in the African context.

What is the AT-Info-Map project?

It is estimated that 85-95% of people with disabilities who need AT do not have access to it in Africa. Without information on the availability of AT, these needs will continue to go unmet. The AT-Info-Map project was initiated in April 2016 to help address the gap in AT information through capturing and mapping AT suppliers and service providers, and coordinating awareness raising activities in Southern Africa.

The Southern Africa Federation of the Disabled (SAFOD) is implementing the AT-Info-Map project through their affiliate national disability advocacy organizations, and in partnership with the African Network for Evidence–to–Action in Disability (AfriNEAD), the University of Washington, and Dimagi.

For more information:

http://assistivetechmap.org

http://www.safod.net/

1. Clocks, Alarms, Memory

This category includes:

- devices for measuring, displaying, and speaking the time
- calendar software
- memory-support products, such as medication reminders, digital/paper memo pads
- personal emergency alarms, such as fall detectors, insulin and seizure alarms
- devices that transform signals from telephones, doorbells, etc. to an understandable output

What do these types of AT do?

They enhance safety, alert the user of incoming signals, and allow people with visual impairments to tell or measure time. They also support people with memory and activity planning.

Measuring, Displaying, and Speaking the Time

This category includes products commonly used by the general population that can also help people with disabilities. For example, Google Calendar can be used to support individuals with intellectual disabilities. This category also includes unique devices, like talking clocks, that may be useful to the general population, but are critical for people without vision.

Calendar Software

Google Calendar

Commonly available calendar software can be used as AT for individuals who need help managing their schedules. Because these systems support shared calendars, a caregiver or friend can add events and set reminders and alarms. Some calendar systems can also be used to send text message reminders.

Telling the Time

Atomic Talking Watch

Adapted clocks help people with disabilities to keep track of the time. This example is a talking watch for people who are blind.

Sonic Bomb with Super Shaker

This alarm clock has a separate vibrating piece that can be placed under the pillow or mattress to shake the bed for people who are deaf.

Memory Support Products

There are many different types of memory support that can remind people of simple tasks (like taking medicine) and more complex tasks.

Medication Reminders

MedQ Reminder Pill Box Dispenser

There are many different types of medication reminders, including simple, low-tech pill organizers and complex management and dispensing systems. This MedQ example has an auditory and visual alarm that reminds you to take your medicine, and a flashing light that indicates which medicines to take.

Timesulin

This timer indicates when a person with diabetes last took an insulin shot.

Low-Tech Cognitive Aids

People with and without disabilities use low-tech cognitive aids such as post-it notes, to-do lists, and timers. They are useful for people with cognitive disabilities.

High-Tech Cognitive Aids

Audio Memory Aid
This memory aid can be used to record up to five messages and set the clock to play back messages at pre-set times. Each message can be assigned two playback times. For example, record "Time to take your medication" and set the clock to play the message at 7 a.m. and again at 6 p.m.

Visual Assistant byAblelink Technologies

This device supports people with cognitive disabilities by guiding a person through a series of steps to complete a task.

Personal Emergency Alarms

Personal emergency alarms alert others if an individual is in trouble. There are many types, including:

- personal panic alarms
- fall detectors,
- medical emergency detectors, like insulin or seizure alarms.

Fall Detectors

Philips HomeSafe

Fear of falling and being unable to get up can result in a loss of independence. Fall detectors support independence by providing notice and linkage to help if someone falls. The Philips HomeSafe uses a pendant and a link to a remote operator. There are many other approaches to fall monitoring.

Insulin and Seizure Alarms

Diabetes Sentry Hypoglycemic Symptom Alarm

These alarms go off when a medical emergency is detected. For example, this bracelet monitors an individual during sleep and wakes them if their blood sugar drops too low. Seizure alarms identify when someone is having a seizure and alerts caregivers.

Devices that Transform Signals

Auditory to Visual

NuTone Wireless Door Strobe/Chime

People who are deaf or hard of hearing can use alerting systems like this visual doorbell. When the bell is pressed, it rings and flashes a light. Other examples are phones that flash while ringing and flashing fire alarms.

Visual to Tactile

Tactile Markers

People who cannot see may benefit from products that translate visual information to tactile (tangible) information, like these tactile stove markers. Another example is the vibrating alarm clock shown above.

2. Communication

This category includes:

- electronic and non-electronic systems for facilitating communication, such as letter, picture, and symbol boards and alternative and augmentative communication devices (AAC)
- audio and visual devices, such as recording devices, Daisy players, closed captioning displays and FM systems
- all assistive products for telephoning and telematic messaging, such as telephones and mobile phones, answering machines, intercoms and entry hones, as well as video communication devices.

What do these types of AT do?

It helps with face-to-face and long-distance communication.

Augmentative and Alternative Communication Devices (AAC)

AAC refers to devices and strategies that compensate for severe communication disorders. These solutions can be:

- high tech or low-tech
- temporary or permanent
- used for expressive or receptive communication

AAC tools are categorized according to whether they are useful for an individual who can spell or not.

Spelling-based Strategies: AAC for Individuals who can Spell

LightWriter from Zygo Inc.

AAC users who can spell do not have to rely on other people to program in vocabulary. They can say anything they want to anyone. Spelling skills as low as 3rd grade-level are sufficient for basic communication. LightWriter is an example of a high-tech device.

Alphabet Board

Simple, low-tech alphabet boards can also be used for communication. Note that the user is pointing with his foot.

Eye-Gaze board

For users who cannot use their limbs for pointing, there are alphabet boards that rely on eye gaze.

DynaVox 3100 from DynaVox Systems, Inc.

AAC users who cannot spell sufficiently, can use non-text approaches like icons or pictures. The vocabulary may be presented in many ways, such as a visual display (device, book, board) or through auditory choices (e.g., "Do you want the bear or the doll?").

High-tech devices, like the DynaVox, have extensive vocabularies.

GoTalk from Attainment Company, Inc.

Simpler electronic tools, like the GoTalk, support a small set of critical words.

Daily Communicator from Interactive Therapeutics, Inc. (left) & Communication Placemat for a Child (right)

Finally, there are paper-based tools like the Daily Communicator or a home-made communication placemat.

AAC Apps for Tablets

Proloquo2go, AssistiveWare

There are many AAC apps that run on tablets, like the iPad. These apps can be downloaded and installed like any other app.

DAISY Players

Plextalk Linio Pocket DAISY Player

DAISY stands for Digital Accessible Information System. It is an international system that supports text-to-speech. It provides a way for people who cannot read to access text. It includes markup that allows for easy navigation through a document. DAISY players are designed to read documents created using the DAISY standard.

Closed Captioning Displays

In-Seat Closed Captioning Display

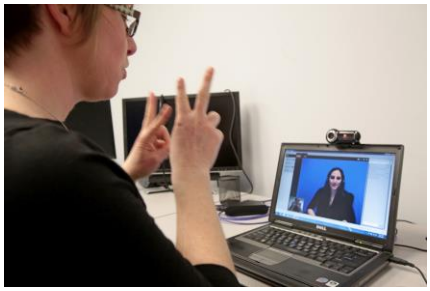
Closed captioning displays replace auditory information (like speech) with text. They are often used at theaters so that people who are deaf can participate.

FM Systems

FM Listening System

FM systems allow people with hearing loss to participate in group or theater events. They are wireless hearing devices that amplify the voice of speakers. Generally, speakers need to have a microphone to broadcast auditory information.

Video Communication Devices



Video Relay

Because video communication devices allow for transmission of both visual and auditory information, they are often used for communication with sign language. In many countries there are video relay services that allow an individual to sign to an operator who speaks to the call recipient.

3. Eating and Drinking

This category includes devices such as:

- special plates, bowls, utensils and cups
- guards and straws
- feeding systems
- other devices to support eating and drinking
- devices for preparing food and drink, including products to assist with weighing, measuring, cutting, chopping, cleaning, peeling, and cooking/frying

This category excludes grip adapters and attachments, as well as non-slip pads (see “Reaching, Grasping and Positioning: To assist/replace arm, hand, finger function or combination of these” and “Reaching, Grasping and Positioning: Products for fixation”).

What do these types of AT do?

Helps people to eat and drink independently and to prepare food and drink.

For eating and drinking

Granny Jo Dignity Mug with two handles (top left), a nosey glass (top right) & a two-handled cup with a lid and drinking spout and a round bottom (bottom)

Adapted cups, glasses and mugs help users to drink without spilling.

Examples:

- A two-handled mug for users with limited strength and dexterity
- A nosey glass/cup with a cut-away section that provides space for the nose to allow users to tilt the cup without tilting the head back
- A cup with a lid and spout or drinking hole prevents spillage
- A weighted cup provides stability for users with tremors
- A round-bottomed cup prevents the cup from tipping over
- Insulated cups protect users with poor sensation from burns

Straws and tubes allow users who cannot hold a glass/cup/mug to drink safely and independently.

Comfort Right Hand Teaspoon (left) & covered spoon (right)

Adapted cutlery such as the curved spoon and the covered spoon allow a person with stiffness or poor hand and arm control to eat independently.

Winsford Self-feeder

This is an example of a self-feeder. It has an automated spoon and plate that can be controlled by a switch operated by head, knee, hip or foot.

Food/plate guard

A food/plate guard raises the side of the plate to prevent food from spilling when eating with one hand.

Bowl with curved side

Bowls and plates with high and/or curved sides prevent spilling when eating with one hand.

Insulated bowl

Insulated bowls and plates with foam insulation or hollow double walls to hold hot water is useful for people who eat very slowly. Foam insulated bowls and plates protect people with poor sensation when holding the plate/bowl in their hands or on their laps.

Egg cup holder & bowl with non-slip base

Bowls, plates and egg cup holders can have slip resistant bases that work with suction or a special non-slip layer to improve stability.

Feeding system with lines

Feeding systems such as gravity and pump feeding sets, naso-gastric tubes, and accessories such as feeding lines/tubes and syringes for feeding are necessary in some cases.

For preparing food and drink

Liquid level indicator

Liquid level indicators are used by persons with visual impairments to indicate when a container is full.

Adapted measuring spoons

Adapted measuring spoons help people with visual impairments.

Bread slicer guide

A bread slicer guide helps persons with visual impairments or poor coordination to slice bread.

Food preparation board with clamp

A large clamp on a food preparation board holds a loaf of bread for cutting with one hand.

Adapted Cutting Board

A cutting board with a clamp and spikes that can hold vegetables or bread allow for one-handed cutting.

Spike-board

Spikes on cutting boards “holds” fruit, vegetables, cheese etc. to be cut or peeled with one hand.

One-hand food preparation board with spikes and grater

A food preparation board with spikes for holding vegetables and an integrated grater allow for one-handed food preparation.

Spreading board

A spreading board with raised edges on one corner to allow one-handed spreading of butter, jams, etc.

Large Grip Spatula

A spatula with a 90-degree grip can be used without bending the wrists.

Talking Microwave Oven

People who cannot see can independently operate a talking microwave oven.

4. Environmental Modifications

This category includes changes to the environment to improve access and provide support during walking, standing, getting up and changing position. Examples are:

- ramps
- stair lifts
- handrails
- grab bars

This category excludes ramps, hoists and platforms for vehicle access.

What do these types of AT do?

Provides access to the built environment and support during walking, standing, getting up or changing position.

Ramps

Ramps allow people who use wheelchairs to access buildings with stairs.

Portable telescoping ramp

Portable folding and telescopic ramps enable access over smaller obstacles.

Stair Lifts

Various options are available to lift people who are unable to climb stairs.

Stairlift for Wheelchairs (left) & Seated Stairlift (right)

Some stairlifts can lift the entire wheelchair.

Seated stairlifts are used by people who can move about, but do not have the strength to climb stairs.

Handrails

Handrails on ramp

Handrails provide physical support for individuals while walking up ramps or climbing stairs.

Grab Bars

Examples of grab bars in the bathroom

Grab bars help to reduce falls in the bathroom and help people to stand up from the bath or toilet.

5. Eye and Skin Protection Barrier Products

This category includes:

- eye protection, such as sunglasses
- substances that protect the skin, such as sunscreen, cleaning agents, barriers and protective creams and ointments provided by prosthetists.

What do these types of AT do?

Protects fair skin and eyes, particularly for people with albinism. Protects skin of people who wear prosthesis or orthotics from chaffing.

Sunglasses

Sunglasses reduce the glare and intensity of the sun.

Sunscreen

Sunscreen blocks harmful radiation and prevents skin burns.

6. Hearing

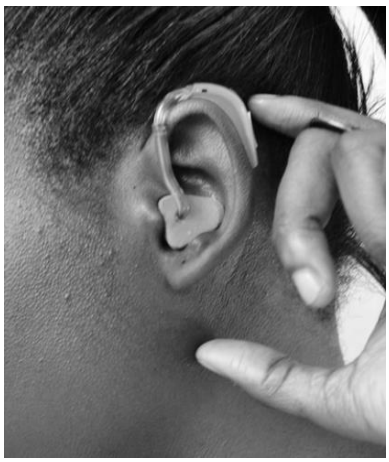
This includes products for enhancing hearing and amplifying sound, such as:

- hearing aids
- amplifiers

What do these types of AT do?

Increases the volume of speech and other sounds to enhance hearing.

Hearing Aids



Hearing aids amplify sounds for people with hearing loss. There are many different types of hearing aids, including those that are in the ear and those that extend out of the ear.

Hearing Aid Batteries and Chargers

These hearing aid rechargeable batteries can be recharged with solar power.

Amplifiers

Telephone Amplifier

There are many types of amplification systems. This example shows a device that amplifies sound from a standard telephone.

7. Mobile and Computer Devices

This category includes:

- portable computers, personal digital assistants, smart phones and tablets
- hardware devices and software for computer input (e.g., adapted and Braille keyboards, adapted mice and mouse software, scanners, speech recognition software) and output (e.g., screen magnifiers, large print/tactile-graphic displays, glare reduction screens, Braille printers and displays, speech synthesizers, and text-to-speech software)
- video communication devices

What do these types of AT do?

Input devices support independent use of computers. Output devices enhance various functions using computer devices.

Portable Computers

Laptop Computer

Computers themselves are not AT, but many types of AT require a computer to function. Computer systems are therefore a necessary part of some AT systems.

Personal Digital Assistants (PDAs), Smart Phones and Tablets

Android Tablet

As with computers, PDAs, smart phones and tablets are not, by themselves, AT. But they become part of an AT system when they are needed to run other software or hardware.

Hardware Devices and Software for Computer Input

Hardware devices for computer input include a range of keyboards, mice, scanners, and speech recognition software.

Adapted Keyboards

One-handed Keyboard (left) & Oversized Keyboard (right)

The example on the left is a one-handed keyboard, while the picture on the right shows a keyboard with extra-large keys.

Braille Keyboards

Braille Keyboard

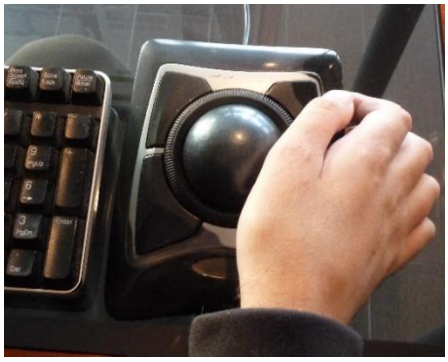
Some keyboards have Braille symbols that allow people who are blind to type.

Braille Keyboard Overlay

Braille keyboard overlays stick on the keys of a standard keyboard.

Alternative Mice

Many people do not have the dexterity or strength to use a standard mouse but can use alternatives.



Trackball

Trackballs are good for people who struggle to move a mouse due to limited reach. Instead of moving the mouse, the ball is moved while the device stays in one position. The roller ball can be moved with any part of the hand, so it does not require finger dexterity.

Finger Mouse

Some people may benefit from a mouse they can hold and control with their thumb as it requires smaller range of motion.

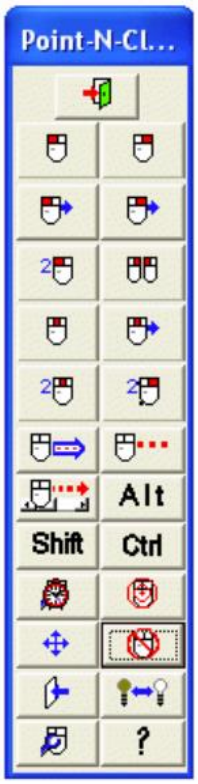
Joystick

Joysticks have many of the same benefits as trackballs. This example has a button to lock the cursor on an item and then drag, rather than having to click and drag, which requires two hands.

Trackpad

Trackpads work well for people who have reasonably good dexterity but difficulty exerting pressure. Sometimes they are built into the laptop. This example shows one that is standalone and can be held on the lap.

Mouse Software



Point and Click Virtual Mouse

Sometimes people cannot control a mechanical mouse at all. In such cases, a person can move a cursor around on a screen using mouse software. This software uses a scanning system. Each button is scanned through and then selected using a single switch interface.

Scanners

Scanner

Scanners can scan text from paper documents, recognize it using optical character recognition and make it available to software systems like screen readers.

Speech Recognition

Man using speech recognition

Many companies sell software that recognize an individual's speech and translate it to text on a computer. Dragon Naturally Speaking is a popular product. Many computer operating systems, like Windows, have speech recognition built in. Speech recognition benefits individuals who are unable to use a keyboard.

Hardware Devices and Software for Computer Output

Screen Magnifiers

Screen Magnifier

Screen magnifiers are placed over a screen to enlarge text and visual elements.

Large Print Displays

Several devices can display large print. They can be software that enlarge text on a computer or hardware systems that magnify text from paper products on a computer screen.

Tactile-Graphic Displays

Refreshable Tactile Graphic Display

Tactile-graphic displays provide visual information through tactile feedback. In this example, refreshable pins raise and lower to map graphic information.

Glare-reduction Screen

For some people with low vision, screen glare interferes with their ability to see information on-screen. Glare-reduction screens can be placed over normal screens to reduce this problem.

Braille Printers

Braille Embosser

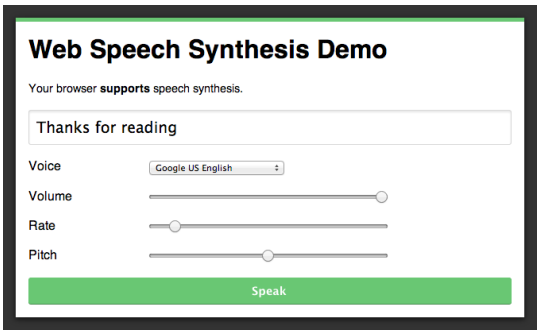
Braille printers emboss thick paper with Braille dots. They are connected to computers with Braille word processors for generating text.

Braille Displays

Braille Display

Braille displays allow users who are blind to read text from a computer in Braille. The display reads the computer screen line by line and translates it to Braille using refreshable pins that raise or lower to create Braille characters.

Speech Synthesizers



Settings Dialog Box for Choosing Synthesized Voices

Speech Synthesizers allow computers to change any written material to speech. They are programmed with the sounds and grammatical rules of a language as well as unusual spellings and letter combinations. They usually allow the user to choose the language, speed, gender, and sound of the voice.

Text-To-Speech Software

Text-to-speech software translates text to speech for users who are blind or have reading disabilities. Programs called screen readers such as JAWS or NDVA can read all the content on a screen, including information provided by the operating system. This allows people who are blind to use all aspects of a computer.

Magnifier/Reader Software

Magnifier and reader software such as ZoomText integrates magnification and screen reading so enlarges, enhances and reads aloud everything on the computer screen.

8. Orientation and Navigation

This category includes:

- devices for orientation, such as white canes
- devices that provide electronic acoustic, visual and tactile information
- devices for navigation, such as global positioning systems (GPS), tactile maps, etc.

What do these types of AT do?

Helps people identify their surroundings and find their way.

White Canes

White cane with close-up of the tip which needs regular replacement

Individuals with visual impairments may need a mobility aid. The long cane is the most common type. It can be folding (far left) or non-folding.

Devices that Provide Electronic Acoustic, Visual and Tactile Information

UltraCane

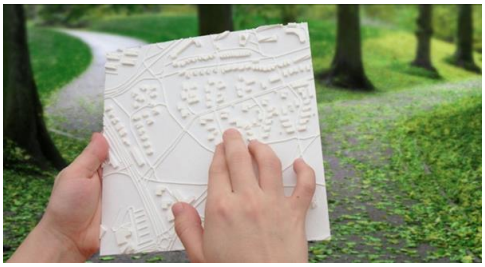
Some canes detect obstacles in all directions via electronic technologies, such as laser, ultrasound or echo-location.

Global Positioning Systems (GPS)

TomTom GPS Device

GPS use satellites to localize an individual's position and map it. They can then provide directions.

Tactile Maps



Tactile Map

Tactile maps convey spatial information by touch rather than visually.

9. Personal Mobility

This category includes:

- the full range of mobility systems, such as canes, crutches, walkers, cycles, manual and powered wheelchairs, prams and buggies
- accessories for these devices (tips, grips, wheels)
- systems for supported transfers, such as transfer boards, lifting belts, and turn tables

What do these types of AT do?

They provide and enhance mobility.

Walking sticks, Canes and Crutches

Walking sticks

Walking sticks are used in one hand by persons with minor balance problems. They may be fixed height or height-adjustable, solid or collapsible, and made from wood, cane, or aluminum. Usually adult sizes only.

Accessories include ferules and height-adjustment mechanisms, such as spring clips.

Quadropod (left) and tripod (right)

Quadropods and tripods are wide-based walking sticks for people with poor balance and only one functional arm. The stick should be used on level surfaces only. Usually adult sizes only.

Accessories include ferules and height-adjustment mechanisms, such as spring clips.

Elbow crutches

Aluminum elbow crutches can be used in pairs by users with poor balance or who cannot take any/all weight on one leg. Users with poor balance and only one functional hand, can use a single crutch.

Different style grips are available. Elbow crutches are available in height-adjustable or fixed-height options, and in adult and child sizes.

Accessories include different style grips, ferules and height-adjustment mechanisms, such as spring clips.

Smart crutches

Smart crutches allow the user to support their weight through both their forearms and hands, instead of just through their hands as with ordinary elbow crutches. The handle of the smart crutch rotates, and it can also be used as a gutter crutch (see below). Available in adult and teen sizes only.

Accessories include cuff pads, platform lock-nuts, ferules, etc.

Gutter crutch

Gutter crutches allow weightbearing through the forearm where the user cannot bear weight through their wrist and hand. Available in adult and child sizes.

Accessories include different Velcro, cuffs, ferules and height-adjustment mechanisms, such as spring clips.

Axilla/axillary crutches

Axilla/axillary crutches are used by persons whose balance is too poor for elbow or smart crutches, but too good to necessitate a walker or rollator. Available in adult and child sizes.

These crutches are made from wood or aluminum. Accessories include different grips, axilla pads, ferules and height-adjustment mechanisms, such as spring clips.

Walkers and rollators

Walking frames (walkers) without wheels (left) and with front wheels (right)

Walkers are used by persons who walk very slowly, have poor balance and cannot control crutches or a rollator. Front wheels enable the walker to be pushed without lifting the entire frame. These walkers can only be used on level terrain. They may have folding, rigid or articulating frames. Walkers are available in adult and child sizes. Different size front wheels are available.

Accessories include ferrules, wheels, grips, height-adjustment mechanisms such as spring clips.

Three (left) and four-wheel (right) walkers (rollators)

Three and four-wheel rollators are used by people whose balance is not good enough to use crutches but who need less support than a walker without wheels would provide. These walkers have folding frames and can be used in- and outdoors. Larger wheels allow for use on more rugged terrain. Available in adult and child sizes.

Accessories include wheels, grips, height-adjustment mechanisms and brakes.

Posture control walkers

These walkers can be used in front (anterior) or from behind (posterior). Posterior walkers, also known as reverse walkers, help with a more upright posture. Available in adult and child sizes.

Posture control walkers are available in child and adult sizes can be ordered with various options, such as:

- additional width for users with leg braces or splints.
- different wheel sizes for different terrains.
- swivel wheels which can be locked/swivel range controlled to help the user to walk in a straight line.
- with seats.
- one-way ratchet control wheels (posterior walkers).

Accessories include wheels, grips, height-adjustment mechanisms, brakes, seats and other posture support options, such as forearm supports.

Rifton gait trainer/full body support walker (left) & Shonaquip gait trainer/full body support walker (right)

These walkers provide partial bodyweight-bearing support in addition to an array of posture-support options. Available in adult and child sizes.

Vehicle adaptations

Push-pull accelerator conversion and steering knob

Driving accessories include devices that help persons with disabilities to safely operate vehicle controls, such as accelerator, brakes, steering wheel, lights and wipers. Examples:

- Pull-push accelerator and brake conversion (hand controls)
- Steering knobs/spinners
- Accelerator reversal

Tie-down wheelchair restraint (top), Sitwell Sitsafe Vehicle travel posture support harness system (bottom left) & Shonaquip vehicle posture support booster seat (bottom right)

Restraint systems provide safety to drivers and passengers and include the following:

- Tie-down and docking systems for wheelchairs
- Special safety belts and harnesses
- Car seats

Vehicle with ramps and platform hoists

Vehicle ramps and lowered floors allow safe access for wheelchair users and provide adequate head clearance. Vehicle wheelchair hoists lift the wheelchair into the vehicle.

Cycles

A bicycle converted to a tricycle

Foot-propelled bicycles include all pedal-propelled cycles, such as bicycles, tricycles and quadricycles. This includes converted bicycles such as the one in the picture. The seat is usually a normal bicycle seat but supports can be added.

Motivation tricycle

Hand-propelled tricycles are used by persons who cannot use their legs. These cycles have more supportive seats than leg powered cycles.

Manual Wheelchairs

Manual active use

Basic folding frame wheelchair (CE Mobility Cruiser) (top left), Adjustable folding frame wheelchair (CE Mobility Pacer Lite) (top right) & Rigid frame wheelchair (CE Mobility Rollability MK2) (bottom)

Manual active use wheelchairs include a wide range of wheelchairs for users who can propel the wheelchair with their arms/hands. These chairs have shorter wheelbases (distance between centre of rear wheel and front castor)and are intended for urban use. Examples:

- Basic folding frame (orthopedic) wheelchairs (minimum adjustment options, usually only footrest adjustability)
- Adjustable folding frame wheelchairs (multiple adjustment options, such as back height, armrest, footrest, rear and front wheel adjustments to optimize fit, posture support and balance)
- Rigid frame wheelchairs (as above, but non-folding frame)

Whirlwind RoughRider Wheelchair (top left), CE Mobility ATW wheelchair (top right) & Motivation Worldmade 3 wheelchair (bottom)

Wheelchairs with long wheel bases (distance between centre of rear wheel and front castor) ensure improved stability over uneven terrain and are often used in rural and peri-urban areas. The larger the rear wheel and caster, the better it will handle uneven terrain. Examples:

- Four-wheel, folding frame designs, such as the RoughRider
- Three-wheel, rigid frame designs, such as the CE Mobility ATW, Lorewo 3-wheeler and Motivation Worldmade 3

Manual posture support wheelchairs

Shonaquip Sam Active wheelchair (left) & Netti II wheelchair (right)

These wheelchairs have posture-support features, such as recline (back to seat angle adjustable) and/or tilt (seat and backrest move back in space). These features may be quick-release or tool-adjustable. These wheelchairs often come standard with a range of backrest, cushion and other posture-support devices, or can be fitted with other available appropriate posture-support devices. These wheelchairs normally have rigid frames. For transport, the rear wheels and back system (if needed) remove and the back posts fold down onto the seat.

Attendant-propelled wheelchairs

Attendant-propelled wheelchair

An attendant-propelled chair may be appropriate for an individual who is unable to propel a manual wheelchair or safely operate a power wheelchair. This type of chair is usually for short-term/temporary use only.

Shonaquip Madiba-2-Go posture support chair (left) & Leckey Mygo on mobility base (right)

Attendant-propelled posture-support wheelchairs include posture-support features such as recline and/or tilt (quick-release or tool-adjustable). These wheelchairs often come standard with a range of backrest, cushion and other posture-support devices. The seat is usually detachable from the base and different bases can be used with the same seat. The frames are collapsible for transport.

Sport/recreational wheelchair

Basketball wheelchair (left) & Dancing wheelchair (right)

Sport and recreational wheelchairs are designed for a specific sport or activity and include wheelchairs for the following:

- Athletics
- Basketball
- Wheelchair rugby
- Tennis
- Ball room dancing
- Beach

Lever-propelled wheelchair

Lever-propelled wheelchair

Lever-propelled wheelchairs are propelled by using two handheld levers.

Power-assist manual wheelchair

Power-assist unit in wheel hub (left) & Smart drive power-assist unit attached to a rigid frame active wheelchair (right)

Power-assist units provide powered assistance to users who self-propel to improve range, speed, power and endurance. Power-assist units are lightweight and can be either a separate unit which is attached to the wheelchair, or special wheels with a unit built into the hub.

Powered Wheelchairs

Power wheelchairs

Power wheelchair with rear-wheel drive and folding frame for indoor and short-distance level-terrain use (top left), Power wheelchair with rear-wheel drive and rigid frame for longer distances and more rugged terrain (top right), Mid-wheel drive (middle) & Front wheel drive (bottom)

Power wheelchairs are used by individuals who cannot use manual chairs but can benefit from independent mobility. It may also be used by persons who:

- have cardiovascular conditions or fatigue easily
- must push long distances or live in very hilly areas

Wheelchairs for indoor use normally have smaller drive wheels and castors. Wheelchairs for longer distances and more rugged terrain have larger drive wheels and castors, more powerful motors and larger battery capacity.

Power chairs may be front-, rear- or mid-wheel drive with folding or rigid frames. They may be driven using hand, foot or chin controls. Special controls, such as sip-and-puff or head controls are available for some models.

Power wheelchair with postural support

Power wheelchair with tilt-in-space and posture-support devices

Like manual wheelchairs, posture-support power wheelchairs offer a range of posture-support options and support devices, such as recline and/or tilt (quick-release or tool-adjustable). These wheelchairs often come standard with a range of backrest, cushion and other posture-support devices, or can be fitted with other available appropriate options. These chairs usually have rigid frames and may be front-, rear- or mid wheel drive. They also usually have various standard and special driving controls.

Scooters

Three-wheeled Scooter (left) & Four-wheeled Scooter (right)

Motorized scooters are used by persons who can walk short distances and want powered mobility, but do not need the degree of posture support provided by a power wheelchair. Scooters can be used in- and outdoors. Those for outdoor and rugged-terrain use have larger wheels, stronger motors and larger battery capacity. Scooters may be rigid or folding and lightweight for easy transport.

Wheelchair accessories

Half-handbikes, powered half-bikes and other attachments

Hand-crank half-bike attachment (left) & Power half-bike attachment (right)

Hand-, power- and hybrid hand-and-power half-bike attachments can be fitted to most manual folding or rigid frame wheelchairs. The half-bike allows the user to travel longer distances, faster and often over more rugged terrain. The user can attach and detach the unit whilst sitting in the wheelchair.

FreeWheel wheelchair attachment

The FreeWheel attachment can be fitted to most manual folding or rigid frame wheelchairs. This attachment transforms the wheelchair into a 3-wheel chair, which is easier to navigate over rough terrain, and allows the user to move faster and further. The unit is compact and lightweight and can be stored on the back of the wheelchair when not in use. The user can attach and detach the unit whilst sitting in the wheelchair.

Lights and safety signaling devices

A flag to improve visibility

Attachments such as flags, lights, reflective strips and mirrors are useful safety devices for users who use their wheelchairs in the community and around traffic.

Spare parts

A range of wheelchair spares

Wheelchair spares are essential items for wheelchair repairs and maintenance.

Devices attached to wheelchairs to hold/carry objects

Mobile phone holder (left) & Water bottle cage (right)

A variety of mounting systems are available for users to mount mobile phones, tablets, water bottles and communication devices to the wheelchair, within easy reach.

Other human-powered vehicles

Transportation chairs

Transportation chairs are evacuation wheelchairs to be used on stairs or rough terrain during emergency evacuations.

Prams and buggies

Attendant-propelled mobility devices, such as prams and buggies (excluding wheelchairs), can be used to transport adults and children.

Crawlers and mobility boards

Supported transfers

Transfer and turning

Transfer board

Transfer boards are used to bridge the gap between the wheelchair and another surface. The user shifts along the board in a sitting or partially standing position. Transfer boards are available in difference shapes, sizes and materials.

Lifting

Transfer belt

Transfer belts are worn around the user's waist and provide grip for helpers to assist with transferring. It can also be used to support the user when walking.

Patient hoist and sling

Patient hoists and slings are used to transfer heavier patients who are not able to assist with the transfer.

10. Pressure Care

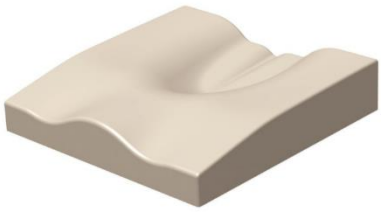
Includes products to prevent pressure sores and ulcers, such as pressure relief cushions and mattresses. Note: Wheelchair cushions for positioning is listed under “Standing, lying and posture devices”.

What do these types of AT do?

Reduces the risk of getting pressure sores.

Pressure Relief Cushions

Proper cushioning is not just a matter of comfort but may also preserve skin integrity and health.



Top: Handmade, layered foam pressure relief cushion seen from behind

Middle:
Motivation moulded foam pressure care cushion (left) & Roho Quattro air-filled cushion (right)

Bottom: Vicair cushion with closed air cells in sections (left) & Jay II gel-filled cushion (right)

Pressure relief cushions are for users with no sensation or high risk of skin breakdown. These cushions are designed to relieve pressure on the sit bones. The sit bones are supported in a hollow at the back of the cushion. High-risk pressure care cushions are normally thicker. Pressure care cushions include foam, air- and gel/fluid-filled cushions, and combinations of foam with air and fluid. Cushion designs vary, and each user must be individually assessed to determine the most appropriate cushion for them.

Wheelchair cushions for comfort and positioning are listed under “Standing, Lying and Sitting posture support”.

Pressure Relief Mattresses

Alternating tube air mattress with pump

People with no sensation and who cannot turn over by themselves in bed, as well as bed-bound patients at risk of developing pressure sores, benefit from using alternating air mattresses. These mattresses are available in different thicknesses and designs.

11. Prostheses and Orthoses

This category includes:

- orthotic devices such as splints and braces for the body, limbs and joints
- therapeutic footwear
- systems for replacing lost limbs, such as upper and lower limb prostheses and prostheses of other body parts.

What do these types of AT do?

Orthotics improve function, and support and enhance joint stability and alignment. Prosthetics replaces the function of lost body parts.

Orthotics

Splints and Braces

Ankle Orthosis

Splints and braces can be used to augment joint stability. This example supports the ankle.

Knee, Ankle, Foot Orthosis

This example connects from the upper thigh to foot to stabilize the knee and ankle.

Upper Extremity Orthoses

This example stabilizes the elbow.

Hand Orthoses

This example stabilizes the hand.

Club Foot Brace

Footwear can be used for therapeutic purposes. This club foot brace keeps a child's corrected foot growing as it should.

Braced Footwear

These shoes have braces that stabilize the ankles.

Diabetic Therapy Shoe

Diabetic therapy shoes reduce ulcers and neuropathic pain associated with diabetes.

Prosthetics

Upper Limb

Upper limb prosthetics replace a lost arm or hand. This example shows one arm/hand replacement that has a realistic hand and one that uses a grabber.

Lower Limb

Basic Lower Limb Prosthetic

Lower limb prosthetics can replace a lost leg or foot. This example shows a basic prosthetic that replaces a full leg and foot.

Blade-Style Lower Leg Prosthetics

Some lower limb prosthetics are designed for sports, like these blade-style prosthetics.

12. Reaching, Grasping and Positioning

This category includes:

- devices for reaching, grasping and holding objects, such as reachers, switches, levers, cranks, grip adapters, mounting systems, suction cups
- devices which assist to open containers, bottles and cans and to extract the contents of a tube

What do these types of AT do?

Helps people to reach and hold items and to open containers and extract contents.

Devices that Assist to Open Containers, Bottles and Cans and Extract Contents of a Tube

One-Handed Jar Opener

Various devices support opening of bottles and cans by those with limited strength and dexterity. This example allows for one-handed opening of jars.

One-handed electric can opener

The picture shows an electric can opener that can be used with one hand.

Ring pull opener

Ring pull openers increase the leverage on the ring pull, making it easier to open.

Squeeze Ease Tube Squeezers

This example helps those with limited dexterity and strength to squeeze the contents from tubes.

Controlling devices

Kettle tipper

A kettle tipper allows users with poor strength and/or control or limited shoulder range to safely pour boiling water.

To assist arm, hand and finger

Includes Grip Adapters and attachments, body-worn holders, stands and operating sticks

Therafin - Universal Feeding Cuff "Fork and Spoon Holder"

A universal cuff is used by persons with poor or no hand grip. The cuff straps around the user's hand and has a sleeve which 'holds' the handle of items such as cutlery, razors, tooth-brushes, etc.

Crossover Grips

Grip adapters can be added to commonly used devices to allow use by someone with limited dexterity. This example shows a grip adapter on a pencil.

Key Turner

This example shows a grip adapter for a key.

Etac Uni turner, a universal adapter

Universal adapters allow easier turning of taps, door knobs and knobs on stoves, etc. for persons with poor strength and dexterity.

Protective grip for grating vegetables

Special grips can provide protection to the fingers and a more secure grasp for grating

Extended reach

Sammons Preston Reacher

Manual gripping tongs allow individuals with limited mobility to reach for, grasp and squeeze objects.

Products for fixation

A bowl stabilizer will keep a mixing bowl in place for persons who have only one hand.

Hover iDevice Mounting System

Some people with disabilities find it difficult to hold devices like a tablet or cell phone. A variety of mounting systems allow devices to be mounted on a desk or wheelchair and positioned for easy access. This example shows a mounting system that holds and iPad.

Table Top Suction Mount

Suction cups are one type of mounting system that can be positioned on flat surfaces without the need of mounting hardware. This example shows a mounting system with single switch interface.

Switches

A wide variety of switches allow people with limited motor function to control a range of devices, including computers and wheelchairs.

 Button Switch	 Small Switch	 Microlight Switch	 Plate Switch
 Tilt Switch	 Pillow Switch	 Foot Switch	 Leaf Switch
 Thumb Switch	 Sip N Puff Switch	 Eye Blink Switch	 Proximity Switch

13. Reproduction and Sexuality

Includes products that support sexual activity such as vacuum systems, vibrators, and massage devices.

What do these types of AT do?

Helps people to engage in sexual and reproductive activities.

Important Notes

1. These types of AT **do not include condoms or other forms of contraception**.
2. Systems that position an individual to engage in intercourse with their partner are not included in this category, but in the next section ("Standing, Lying and Sitting Posture Support").

Vacuum Systems

Vacuum systems are designed to help men with erectile dysfunction maintain erections. Most systems include a clear plastic cylinder that is placed over the penis and connected to a pump which creates negative pressure and pulls blood into the penis, resulting in an erection.

Vibrators and Massage Devices

Vibrators provide stimulation that can result in ejaculation and allow for sperm collection. They can lead to orgasm without an erection. They have been used effectively, for example, by men with spinal cord injuries.

14. Standing, Lying and Sitting Posture Support

This category includes:

- devices to support standing, such as standing frames
- devices to support lying, such as lying/sleeping supports, bed rails, height and posture adjustable beds, mattresses (excluding pressure care mattresses) and special bedding
- devices to support sitting, such as custom seats, floor seats, posture support devices for wheelchairs, including trunk, head, pelvis, leg, arm and foot supports
- lap trays and seat/wheelchair cushions for positioning (excluding pressure care cushions)

What do these types of AT do?

Support people to be safely and comfortably positioned in standing, lying and sitting postures.

Standing Frames

Shonaquip prone/supine/upright standing frame (left) & Timion upright standing frame (right)

A standing frame provides passive support to individuals who are unable to stand unsupported. Different types and styles are available, such as prone, supine and upright frames. Frames usually have a work surface to allow the user to do tasks while supported in standing. Standing frames are available for adults and children.

Lying/Sleeping Supports

Sleeping supports

Lying/sleeping supports help to position people in bed in comfortable and safe positions.

Bed Rails

Bed rails protect individuals from rolling out of bed and can be used for support when standing up or lowering.

Height and Posture Adjustable Beds

Height Adjustable and Posture Supporting Bed

Height and posture adjustable beds can be raised to facilitate caregiving and adjusted to maximize comfort. Beds may be manually or electrically controlled. Many beds come standard with accessories such as side rails.

Special Seats

Posture support chairs

Timion posture-support chair (left) & Movation Moti Start support chair (right)

Posture support chairs provide alternative seating to persons with extensive posture support needs and who cannot sit upright without support. These chairs usually have tilt in space and recline options.

Custom molded seat insert

Custom molded seats are custom made for the individual and set in a hard, shell base. This seat is then attached to a wheelchair or other chair. These seats help users with severe postural deviations who cannot use standard products.

Floor Seats

Leckey corner seat with tray and head support (left) & Jana early development seating aid (right)

Floor seats provide support for children who cannot sit up on their own, so they can sit at floor level for play and engagement with peers.

Posture Support Devices for Wheelchairs

Back support with/without trunk, pelvis and head supports

Top: Tension-adjustable backrest (left) & Jay III solid backrest with pelvis side supports and head support (right)

Middle: Jay III solid adjustable backrest (left) & Spex solid backrest with trunk side supports and headrest (right)

Bottom: Shonaquip Tess solid adjustable backrest with integrated trunk and pelvis side supports (left) & V-track modular back system (right)

Back systems provide additional support to users who cannot sit up without support and who need more support than the standard backrest of a wheelchair. These back systems can be added to most wheelchairs and include:

- Tension-adjustable backrests
- Solid adjustable backrests
- Modular adjustable backrests

Backrests can have additional supports such as:

- Trunk supports
- Pelvis supports
- Head supports

Armrests and arm rest supports, excluding lap trays




Top: Height-adjustable full arm rests (left) & Pole arm rests (right)

Bottom: Fixed height desk-style arm rests (left) & Molded armrest pads with elbow support and hand support (right)

Arm rests provide arm support for sitting and additional support during transfers. There are different styles, such as supports with side panels and pole arm rests, and different lengths, i.e. full length or desk length (shorter). Armrests may be fixed, removable or flip back. They may be mounted to the seat frame or backrest frame and may be fixed height or height-adjustable.

Lap Trays


Clear lap tray (left) & Wooden lap tray (right)

Lap trays provide additional arm support and work surfaces for activities such as reading, eating, working on a computer, playing, etc.

Footrests and foot supports





Top: Angle-adjustable footrest hangers (left) & Ankle straps (right)

Bottom: Angle-adjustable footplates (left) & Foot supports for footplate (right)

Various footplates are available to support wheelchair users' feet. They may be single or double and may flip up and/or swing away for transfers. Some are detachable. Special footrests and accessories include:

- Angle-adjustable footrest hangers for users with limited knee flexion or extension
- Angle-adjustable footplates to accommodate deviations of the ankles
- Ankle, toe, or heel straps to support feet
- Additional foot support

Seat cushions

Top: Handmade layered foam positioner cushions (left) & Jay Active cushion with small gel pad (right)

Bottom: Molded foam cushion (left) & Roho Airlite molded foam cushion with enclosed air cells (right)

A wheelchair must always be issued with a cushion. If the user does not have a pressure sore risk, a basic cushion can be used for comfort and positioning. These cushions are often thinner than pressure care cushions and do not have a deep sit bone well area. These cushions are typically made from foam but may also be foam and air or gel combinations. The air and gel pads are typically thinner and smaller than those on pressure care cushions.

For wheelchair pressure care cushions see “Pressure care”.

15. Toileting and Bathing

Includes devices for personal care such as:

- raised toilet seats
- bed pans
- ostomy care products
- catheters
- diapers
- bath seats and shower chairs

What do these types of AT do?

Helps to support bathing, toileting and continence management.

Raised Toilet Seats

Raised Toilet Seat with hand rails (left) & without handles (right)

Raised toilet seats reduce the need to bend joints beyond 90-degree angles and make it easier to stand up. Some come with hand rails.

Bed Pans

Bed pans allow for toileting when an individual is unable to leave their bed.

Diapers

Diaper

Individuals who are have lost bladder or bowel control may use adult diapers to manage toileting and to facilitate easy cleaning.

Commodes

Top: Static commode (left) & Self-propelling commode (right)

Bottom: Attendant-propelled commode (left) & Timion height-adjustable toilet bench (right)

Commodes are toilet chairs which can be used as a standalone item with a bucket or positioned over a toilet without the bucket. Commodes can be static, attendant-propelled or self-propelling.

Ostomy Care

Colostomy Care Items

People who have had a colostomy require items to enable them to empty their bowels.

Catheters

Foley Catheter

People who have lost bladder control use catheters to manage release of urine.

Bath Seats

Top: Bath chair (left), Bath board (centre) & Wooden bath board and bath bench (right)

Bottom: Leckey reclining bath seat with posture supports (left) & Shonaquip reclining bath seat for children (centre and right)

Bath seats position and support individuals in the bath. More supportive versions have backrests. Bath seats with reclined or tilted seats provide support to persons who cannot sit upright, even with a backrest.

Shower chairs

Shower Chair with armrests (top left), Leckey bath seat on shower trolley base (bottom left) & Tilt-in-space shower chair and commode combination (right)

Shower chairs allow individuals to shower while seated to reduce the risk of falling. Tilt in space and reclining chairs provide additional support for users who cannot sit upright, even with backrest support.

16. Vision

Includes devices to improve sight, such as spectacles, contact lenses, and magnifiers.

What do these types of AT do?

Augments or magnifies vision. Note: Does not include computer systems.

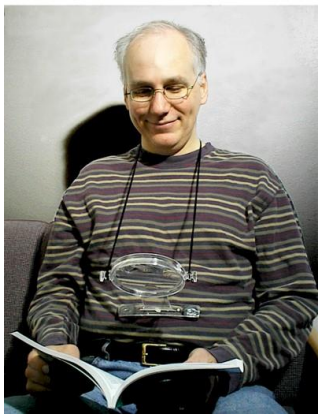
Spectacles

Spectacles are commonly used to compensate for changes in vision.

Contact Lenses

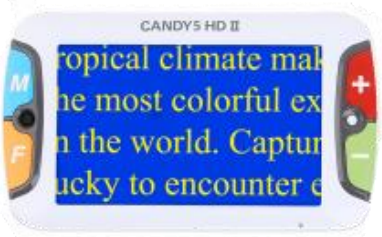
Contact lenses provide another way to compensate for changes in vision.

Magnifiers



Optical Magnifier for Reading

People with low vision may rely on magnifiers for reading and other visual tasks. This example shows a neck-worn magnifier used for reading. It can also be used for crafts like knitting or needlepoint.

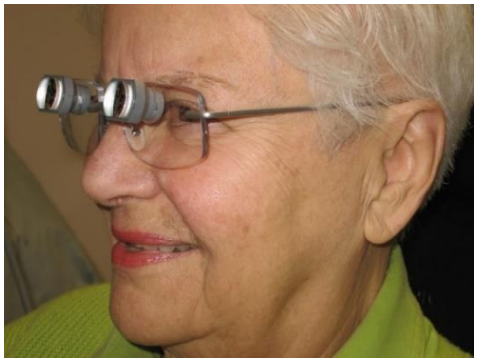


Handheld Electronic Magnifiers

These handheld electronic magnifiers use a camera and screen to magnify printed text and images.

Monocular Telescope

A monocular telescope is used with one eye and has a single eyepiece. It can be used for viewing things at a range of distances, including up close.



Binocular Telescope

Binocular telescopes are used with both eyes and are usually clipped to glasses, so they can be used hands-free.

17. Writing, Reading and Braille

This category includes devices that support reading and writing (in text or Braille), such as:

- audio materials
- large print materials
- tactile reading
- page turners
- signature guides
- Braille writing equipment, type writers, and word processors, including writing and Braille software.

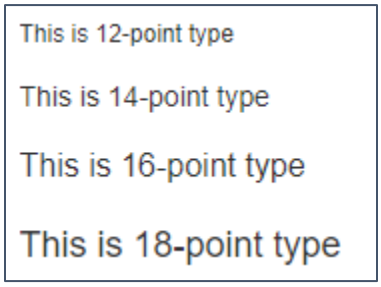
What do these types of AT do?

They help people to read and write.

Audio Materials

Text can be provided in auditory format for people who are blind. Many countries provide materials in auditory format through Talking Book libraries. Many countries also have rules that require publishers to use standards that allow for development of auditory versions of their books.

Large Print Materials



People with low vision need large print reading materials. When materials are on paper rather than electronic, people may request large print. A general rule of thumb is that it should be 18-point font or larger.

Tactile Reading

Embossed Type

In addition to Braille, there are other approaches to tactile reading. This example shows embossed letters for tactile reading of English.

Page Turners

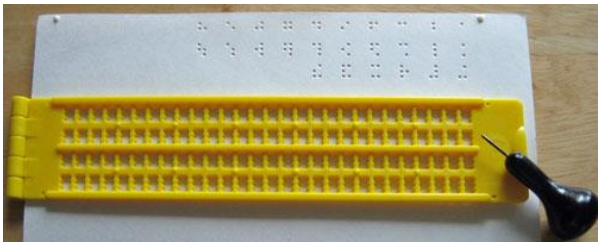
Low-tech strategy to provide independent page turning

People with limited dexterity may find it difficult to hold and turn the pages of a book.

Signature Guides

Signature guides support an individual with limited dexterity to sign a specific part of a paper.

Braille Writing Equipment



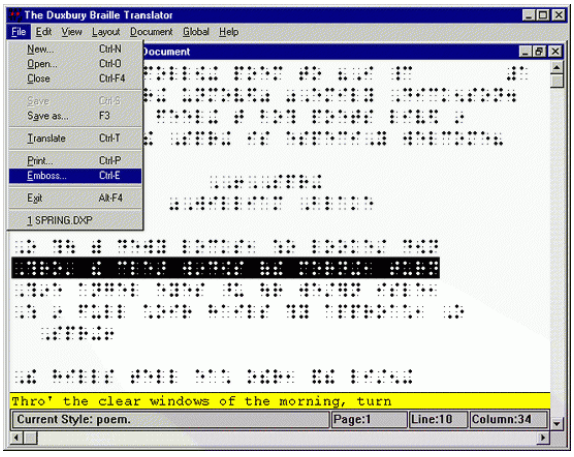
Braille Slate and Stylus

Braille can be created manually with a Braille slate and a stylus that pokes holes in the paper.

Braille Typewriters & Notetakers

Braille can be created using special Braille typewriters or notetakers that are manual or digital.

Braille Word Processors



Duxbury Braille Translator

Braille can be created using Braille word processors and then printed with a Braille printer.