*This information is for informational purposes only and cannot be seen as an endorsement.

AT for Motor Accommodations

According to Hammond and colleagues (2017) study investigating the effects of inflammatory arthritis on employment, it was found that motor impairments can lead to "work disability, absenteeism, and presenteeism (i.e. at-work productivity loss) at high cost to individuals, employers and society", however, vocational rehabilitation was found to be a valuable tool to aid individuals in need of motor accommodations in the workplace (p. 1). Marini and colleagues (2008), Huang and colleagues (2013), and Targett and colleagues (2004) agreed, all studies representatively finding the addition of vocational rehabilitation services to be a valuable asset to helping individuals seeking motor accommodations gain or maintain successful employment. Basas's (2013) study regarding Universal Design observed that individuals who request work accommodations most often are seeking AT to accommodate motor or mobility impairments. According to Beukelman (2007), "there is a need for technology that can be adjusted to meet a range of motor capability demands, as it is not uncommon for users to utilize more than one access strategy" (p. 232). Similarly, Arathanat, Lesner, and Sundar (2016) and Asselin (2014) agree that assistive technology (AT) can compensate or enhance motor accommodations an individual may require.

If you have any further questions on this topic please view the information below or contact the Department for Aging and Rehabilitative Services (DARS) to be connected with an occupational therapist who is skilled in AT for individualized services. If you would like more information on which app is best for you without applying for services, please see Georgia Tech's "Tools for Life" resource at https://gatfl.gatech.edu/favorite-search.php. For further information on job accommodations in the workplace please visit https://askjan.org or https://www.resna.org to find a certified AT specialist. For more information on low interest loans on assistive technology, please visit https://www.atlfa.org.

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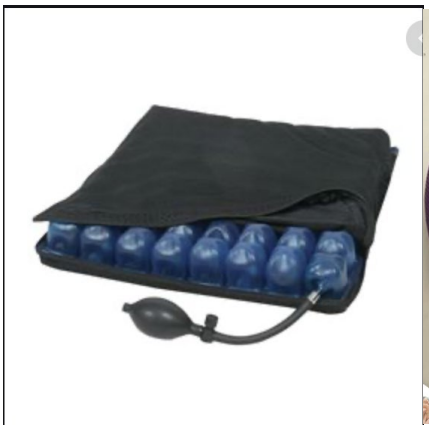
1. Posture, Alignment, and Seating Ergonomics
    - There are multiple types of AT that can assist with posture and alignment or enhance an individual's ergonomics. For wheelchair users, it is also imperative that the individual is positioned in their chair correctly to prevent unnecessary injury or strain. To prevent this, it is important that the arm rests, seat height and depth, and lumbar support are adequately fitted to the individual and are even adjustable if possible. The postural, alignment, and seating aids such as seat or back cushions available for individuals in need of additional support in this area widely vary in this topic because these aids can largely vary in both the type of support and the type of material they are made from.
    - For example, if an individual had a T6 Spinal Cord Injury, they need to practice pressure relief every 30 minutes in order to prevent pressure ulcers. Along with this, they need to have seating cushions that evenly distribute their weight across the seat and maintain good ergonomics to prevent pressure ulcers as well.

    - In the workplace, it is important to maintain good ergonomics to maintain productivity. Please watch https://www.youtube.com/watch?v=Os9XkGhN2Hw&feature=youtu.be an example and overview of good ergonomics at the workstation. There are a variety of ergonomic aids that can promote optimal alignment. Examples of these aids that may be used as motor and mobility accommodations are height adjustable desks (https://www.flexispot.com/electric-height-adjustable-standing-desk-ec1-48-w?gclid=Cj0KCQiA6t6ABhDMARIsAONIYyzKeYpxlopx-Erka5INdsClJ5Qf9D0ZrEKyPvNPbGwja0L5nIkCm48aAvIiEALw_wcB), various seating cushions or other devices, and foot rests. If you have any additional questions regarding this topic please contact an Occupational or Physical Therapist who specializes in ergonomics. Seating and Mobility clinics at larger hospitals can also offer assistance with this matter. For additional information on this topic please review https://www.aota.org/~/media/Corporate/Files/Practice/Manage/Home-Office-Ergonomics-Tips.pdf and https://www.aota.org/About-Occupational-Therapy/Professionals/WI/Ergonomics.aspx for more information.



2. Technology that Aid Mobility
    - There are various types of AT that aids mobility such as walkers, power wheelchairs, standing wheelchairs, hospital beds, in-home stair lifts or elevators, and many others depending on the type of mobility accommodation an individual requires. Additionally, there are multiple types of supplemental devices that can be attached to desks, wheelchairs, etc such as arm rests. For example scenario, an individual requiring motor accommodations after their stroke may require an armrest due to muscle fatigue with prolonged use of their arm and the armrest allows them to rest their arm whenever needed so that they can continue working without overexerting themselves. Please contact an Occupational or Physical Therapist who specializes in ergonomics if you have further questions on this topic.

3. Technology that Aids Transportation
    - There are various types of transportation options for individuals who require accommodations. Some examples of these are wheelchair accessible vehicles such as vans (see picture below) and buses, or vehicles that have been modified to accommodate for specific deficits, such as installing hand controls for the gas and brake for individuals who do not have use of their lower extremities. For more information on hand controls please visit https://www.mobilityworks.com/hand-controls/. If you would like further information regarding vehicle selection please contact Association for Driver Rehabilitation Specialists (www.ADED.net) for individualized recommendations and assistance.

4. Technology that Aids Manipulation and Control of the Environment
    - AT such as mouth sticks (https://mouse4all.com/en/articles/mouth-sticks-for-quadriplegics/), head pointers (picture on top right), joysticks (picture on top left), built-up handles (picture on bottom left), stabilizing devices (picture on bottoms right), arm supports (https://www.ergoexperts.com/products/ergorest-articulating-arm-rest?gclid=Cj0KCQiAj9iBBhCJARIsAE9qRtBOgVssAg3BMURCdP7YVezQVFmeNJVpJ6GGZPtG5sQYjIEr-RCF0uAaAhY7EALw_wcB), and the use of ebooks such as for reading textbooks are great examples of technology that promotes independence for individuals in need of motor accommodations. Please see https://assistedtechnology.weebly.com/motor-disabilities-katie-alsip.html for more information on this topic, contact an Occupational or Physical Therapist, or apply for services with DARS if you have further questions or would like to apply for individualized services.

5. Electronic Aids for Computer Access
    - Electronic aids for computer access greatly vary on the type of accommodation that an individual in need of motor accommodations is seeking. Some examples include the use of Speech to Text software such as Dragon (https://www.youtube.com/watch?v=uXXvJ-4Abbc), or accessibility features on Mac and Window devices. Other types of software such as Eye Gaze (https://www.youtube.com/watch?v=XrVJ1JaMSew), and keyboards and mice designed for individuals with limited upper extremity use, such as trackball mice or one handed keyboards (https://www.walmart.com/ip/TSV-One-Handed-Gaming-Keyboard-RGB-LED-Backlit-Hand-Rest-with-35-Keys-Black-1-Pack/234367247) are often utilized as well. These examples are all great options for individuals seeking adaptations for computer access. Please view https://youtu.be/1_C1u2hEjMI for a general keyboard demonstration overview or apply for services with DARS for individualized recommendations regarding this topic.

6. Electronic Aids for Enhanced Accessibility for ADLs
    - Electronic aids for enhanced accessibility to perform activities of daily living (ADLs) can also greatly vary on the type of accommodation that an individual in need of motor accommodations is seeking. Examples include the use of smart home software features, voice assistants such as Alexa and Siri to support learning memory features, and many other options specific to the type of motor accommodation required. Certain software or apps can also help with specific topics, such as math, where One Note or Equatio can be very helpful.
        - How to use Siri (https://youtu.be/Y1icPfy_ZNQ)
            - How to set reminders on your iPhone (https://youtu.be/DN7FwObY_uQ)
            - How to set reminders with Siri (https://youtu.be/DN7FwObY_uQ)
    - https://www.vivint.com/packages/home-automation
    - https://www.youtube.com/watch?v=uWDAJjqBIxY&feature=emb_logo

7. Non Electronic Aids for Enhanced Accessibility for ADLs
    - Besides electronic aids, there are countless non electronic devices and tools available for individuals seeking motor accommodations to enhance their independence in ADLs. The websites below have numerous resources available for more information on this topic. Please apply for services with DARS for individualized assistance in this area if needed.
        - The MaxiAids (https://www.maxiaids.com)
        - AliMed (https://www.alimed.com/?gclid=Cj0KCQiAst2BBhDJARIsAGo2ldXMTq5uBAShPmXdJvm2dBOzIZ2FPm3S5M4oSaqJGuv3EKDxL8Vy9dwaApWKEALw_wcB)

- Some examples of AT in this area are:
    - Reacher
    - Sock aid
    - Raised toilet seat
    - 3 in 1 commode
    - Built up utensils
    - Leg lifters
    - Oven pull out rack devices
    - CatTongue Grip tape (can be added to any device for a firmer hold)
    - Bed rail
    - Shower chair
    - Folding cane
    - No ring doorbell
    - Rechargeable flashlight
    - Tub transfer bench
    - Long handled sponge
    - Long handled duster
    - Wall pull down shelf contraptions
    - Other examples can be found at https://docs.google.com/document/d/1CzqsMCAwqzUlfTXQWjB6EqAh0nfnGesg/edit

8. Participation Aids
    - Strumbo (2009) notes that AT is a foundational support for individuals with physical disabilities that can offer life-altering benefits. Among the various other benefits AT can bring in the categories mentioned above, participation aids for those seeking motor accommodations typically focus on assisting individuals in structuring their day differently in aim to promote both independence and productivity. AT participation aids can range from the use of apps to adjustable bedside tables depending on what type of motor accommodations an individual is seeking.

    - Additionally, Wong and colleagues (2019) found that "Executive functioning, in particular sequencing and inhibitory control, strongly predicts employment and highlights the importance of cognitive strategy training during occupational therapy with people who have sustained neurological injuries." (p.1). From the result of this study it can be seen that individuals seeking motor accommodations after sustaining neurological injuries may also benefit from from cognitive

strategies. For more information on this topic please view the “AT for Cognitive Accommodations” resource. For more information on participation aids please contact an OT who specializes in AT or apply for individualized services with DARS.

Case Study examples:

James is a 48-year-old male who has been referred for services with an occupational therapist who specializes in assistive technology to identify methods to improve his access to his workstation. James had a spinal cord injury six years ago and most frequently uses a manual wheelchair due to the ease of access it provides him to his workstation. On occasion, he also works from his power wheelchair because his spine begins to cause him discomfort after a few hours in the manual wheelchair and the power wheelchair offers more support. Additionally, James also has a standing frame which he uses for up to two hours a day during his workday for health promotion. Since beginning to work virtually due to the Coronavirus, James has been working at a U-shaped desk with a 40" monitor positioned against the wall to portray an enlarged version of his laptop screen, which he needs for his job duties. He works approximately 30 hours a week. Unfortunately, James is unable to get his power wheelchair under the desk, and his manual wheelchair is too low to be able to reach the desk height well either. His large computer monitor is resting on the desk, and the height causes neck extension to view it. This is a risk factor for a neck injury and he indicates that he is uncomfortable and occasionally experiences headaches after prolonged working in this position. Additionally, James expresses having developed numbness in his fingers while typing due to the angle of his hands on the keyboard while typing. After reviewing his workspace and positioning needs, it was evident that three different heights are needed for the workstation to accommodate working from the manual and power wheelchairs, and the standing frame. The desktop needs to be able to be positioned low enough to allow the forearms to be parallel to the floor in each of these positions and needs to support the weight of his monitor. An electric standing desk appears to be the best option to meet these different heights as this will allow James to work from each of his wheelchairs, as well as promote health while working from the standing frame.

Penny is a 61-year-old female, has been referred for services with an occupational therapist who specializes in assistive technology to identify methods of computer access without the use of her hands. Penny was diagnosed with Lupus three years ago and has extreme pain in her hands with movement. Since beginning to work virtually due to the Coronavirus, Penny has had to use the computer much more frequently than before. In an effort to relieve her pain, Penny purchased and attempted to use Dragon Professional Individual speech-to-text software, however, was not finding it supportive in completing her job duties in a timely manner. Penny is a native Spanish speaker and reported that the software was dictating more wrong words than right ones, she believes in large part that this is due to her accent. Penny was then assisted in setting up Dragon to accommodate for her accent, however, when Penny demonstrated her use of the software poor recognition accuracy with Dragon continued to be observed. Penny was trained to speak

slowly and clearly, and her recognition accuracy improved with this change. She required cues throughout the session to maintain this voice pattern and she was encouraged to practice training herself to speak deliberately, not conversationally, to the software. Additionally, Penny was also able to operate the mouse using her voice with the Dragon software. She was encouraged to use this feature more to become more comfortable/ efficient with the use of Dragon and to prevent her from causing unnecessary strain to her hands.

Harry is a 18-year-old male who was born with cerebral palsy. Harry is starting his second semester of college this year and is majoring in Physics. Due to Harry's lack of upper extremity use, he utilizes a scribe for note-taking during class. Harry's college provided him an iPad to increase his access to more applications for his schoolwork. However, he hasn't found a good app for math homework yet and reports he will be taking multiple math classes as part of his Physics major this semester. Last semester he had a trial of Equatio but found that it wasn't meeting his needs. He contacted DARS for assistance due to the longevity of his need for access to math-enabled software for his heavily math-based curriculum. Currently, the iPad is Harry's only piece of technology and he is able to complete all his other schoolwork on it with the use of Dragon Professional. After meeting with an occupational therapist that specializes in assistive technology, it was determined that Harry qualified for the provision of a laptop to be able to use Office 365 to successfully complete his schoolwork throughout his degree program.

Theo is a 21-year-old male who has been diagnosed with Autism Spectrum Disorder and experienced a right-sided brachial plexus injury at birth. Theo just attained his first job working in a fast-food restaurant. After two weeks of employment, Theo's manager has contacted DARS because Theo has been seen having difficulty lifting the mopping bucket in and out of the sink and sweeping the restaurant floor with the restaurant's standard broom due to the lack of strength from his brachial plexus injury affecting his right hand. After meeting with an occupational therapist who specializes in assistive technology, it was determined that there could be a wooden palate placed in front of the sink where the mopping bucket needs to be emptied to decrease the amount of effort needed to empty the heavy bucket into the sink. Additionally, the occupational therapist recommended a removable hand gripper attachment be placed onto the broom to hold

Theo's right hand in place while sweeping. With these adjustments, Theo is now able to complete his work duties successfully and his manager is satisfied with his performance.

Jenna is a 38-year-old female who was born with spinal muscular atrophy. She has been utilizing a manual wheelchair since the age of 16. Two years ago, Jenna fell while toileting and broke her leg and has since been very fearful of falling again. Jenna is independent in most activities but has lost a significant amount of strength in her arms and legs since her fall and her husband has been helping her with transfers more frequently. Upon meeting with an occupational therapist who specializes in assistive technology, different areas of assistive technology use around her home were discussed to improve Jenna's accessibility and focus on preventing falls. Fall prevention recommendations included the installation of grab bars in the bathroom, specifically around the toilet and in the shower, wearing shoes whenever possible to provide steadier footing, and decluttering all common spaces of potential hazards (such as rugs, cords, etc.,). Additionally, focus was placed on returning to more independent transfers through her battle with her progressive disease for Jenna to maintain as much strength as possible.

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