Long-Term Services & Supports Feasibility Policy Note

Assistive Technology: Tools for Care

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This policy note considers the use of assistive technology in alleviating functional restraints due to persistent physical limitations. Put in terms of long-term care, assistive technology is a means of addressing the inability to regularly perform Activities of Daily Living (ADL). Use of assistive devices by care-receivers may allow for greater personal autonomy and lessen the burden on care-givers. Generally, the effect of assistive technology is to mitigate, not to cure. Assistive technologies are tools for alleviating deficits in functionality, but will not wholly eliminate functionality issues nor take the place of formal, human-given care (Agree et al. 2005; Anderson and Wiener 2013).

This policy note will first review the definition and scope of assistive technology. The growing interest in assistive technology and the expected benefits and risks from use will be assessed. Finally, this note will cover assistive technology research and highlight key limitations of current assistive technology use.

1. What is Assistive Technology?

In the US, the Technology Related Assistance for Individuals with Disabilities Act (Tech Act) informs all laws and governmental policies that deal with disability (Wallace 2011). The Tech Act, initially authorized in 1988, was the US's first federal recognition of assistive technology. The Tech Act has been amended and re-authorized in 1994, 1998, and 2004. The Tech Act provides federal definitions of assistive technology, assistive technology device, and assistive technology service.

The Tech Act defines each of these terms as follows: 1) assistive technology refers to "technology designed to be utilized in an assistive technology device or assistive technology service"; 2) assistive technology device refers to "any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities"; and 3) assistive technology service refers to "any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive

technology device" (Technology-Related Assistance for Individuals with Disabilities Act Amendments of 2004, P.L. 108-364 2004:4).

The Tech Act definitions for assistive technology and its component devices and services are highly inclusive. Even devices and services not necessarily designed to support disabilities may be defined as assistive technology (Andrich et al. 2013). Assistive devices can be common and mundane items such as stools or benches, canes, walkers, pencil grips, railing systems, shoe horns, or smart phones. More specialized assistive devices, made for particular disabilities, include eye glasses, hearing aids, automatic lighting, food bumpers (an attachment for dishes that provide a wall for scooping food against), prosthetics, and wheelchairs. Assistive technology services include all business dealing with assessment, prescription, procurement, employment, and ongoing upkeep of assistive devices. Services cover a range from the medical evaluation of a disability, the assessment that recommends assistive device use, the commercial services that deal in assistive devices procurement and delivery, the instructions and training involved in assistive device use, to any maintenance of medical assessments related to the assistive device.

2. Growing Interest in Assistive Technology

The last few decades has seen a great deal of interest in assistive technology, both in the US and internationally. There are primarily two sources for the rise in interest. First, assistive technology was recognized, politically, as a means of bettering the lives of those with disabilities (De Joode, van Heugten, Verhey and van Boxtel, 2010; Gillespie, Best, and O'Neill 2012; Wallace 2011; Wise 2012), particularly in the aspect of helping children with disabilities learn better in school (Benedict et al. 1999). In the US, the political interest in assistive technologies can be found in the Tech Act and also in the educationally focused Individuals with Disabilities Education Act (IDEA). Internationally, the use of assistive technology has been endorsed by both the World Health Organization (Fifty-Eighth World Health Assembly 2005) and the United Nations (Sixty-first Session United Nations General Assembly 2006) and some countries maintain their own assistive technology legislation (Barfai and Boman 2011).

The second source of interest, and the one most important for this policy note's consideration of long term care, was the consideration of assistive technology as a means for preparing to meet the needs of an aging population (Andrich et al. 2013; Fifty-Eighth World Health Assembly 2005, Marschollek et al. 2009). The US, like many industrialized nations, has an elongating population pyramid. More of the population is living longer to ages where physical frailty and persistent disabilities become a common concern.

3. Benefits and Risks of Assistive Technology

Outcomes research for assistive technologies have found both benefits and risks. Generally, assistive technologies offer more good than harm. There is a lot of research that find assistive technology has beneficial effects for users (Anttila et al. 2012; Chase et al. 2012; De Joode et al. 2010; Gillespie, Best, and O'Neill 2012; Ludwig et al. 2012).

There is, however, also evidence that some assistive devices may not offer any benefit compared to non-use or may increase the risk of harm (Anttila et al 2012; De Joode et al. 2010, Capezuti, Maislin,

Strumpf, and Evans 2002; Ryan 2010; Saufl 2004). For example, a systematic review by Anttila et al (2012) found four studies that maintain hip protectors offer little to no protection for hip fractures in institutionalized older people, and no protection at all for older community-dwelling people. Anttila et al (2012) further found wheelchair seat boards and wheelchair cushions do not offer benefits, while wheelchair seat restraints may lead to asphyxia. Bed rails are another type of assistive devices with some research suggesting they provide no benefits and potentially increased risks of injury (Capezuti et al. 2002; Saufl 2004). Similarly, Ryan (2010), while looking at the use of protective equipment for children, suggests that assistive device use could result in greater risk allowance by care-givers (i.e., that they would allow the care-receivers to engage in more risky behaviors). Some caution may be advisable when considering use of assistive technologies.

One area of great interest is the potential for assistive technologies to reduce costs by reducing or replacing formal care. Some early research suggested that assistive technologies could reduce formal care (Agree and Freedman 2003; Hoenig et al. 2003). Subsequent research, though, curtailed that optimism and found that assistive technologies could not replace formal care (Agree et al. 2005; Anderson and Wiener 2013). Still, with the advent of newer smart technologies the possibility remains (worth mentioning is Aloulou1 et al. (2013) who examined motion and pressure sensors).

4. Limitations in Assistive Technology Use

There are complications in the employment of assistive devices. Just because a device exists does not mean people can or will use it. There can be structural problems preventing use. It is possible that potential users may have difficulty learning about assistive technologies or being assessed for assistive technology use (Demain et al. 2013). In addition, there may also be issues with costs in purchasing and maintaining devices and services (for further information on government funding of assistive technologies in the US see Finlayson and Hammel (2003) and Wallace (2011)).

Some may choose not to adopt assistive devices. Willingness to adopt assistive technology can be affected by personal knowledge of and experiences with assistive technologies, access to assistive technology, needs, desires, beliefs, and abilities (Jensen 2014; Scherer, Craddock, and Mackeogh 2011). Concerns of loss of privacy, loss of social interaction, and fear of social stigma attached to use are some reasons people refuse to adopt assistive technology (Damodaran and Olphert 2010). For older users, there may be discomfort with newer (i.e., digital and computer) technology (Czaja et al. 2006).

It may also be difficult to find a proper fit with available assistive technology. Research by Fehr, Langbein, and Skaar (2000), who surveyed clinicians to assess the adequacy of power wheelchair control interfaces, helps to illustrate this issue. Fehr et al. (2000) found that, despite the range of control interfaces available (e.g., joystick, sip-and-puff, chin and head, tongue touch pads, and eye gaze systems), clinicians reported that 9 to 10 percent of patients who receive power wheelchair training find it difficult or impossible to use the wheelchair for ADLs after training, 40 percent of power wheelchair users have difficulty maneuvering, and 85 percent of clinicians saw some patients who could not use a power wheelchair because of lack of motor skill, strength, or visual acuity. Interestingly, Fehr et al. (2000) also found that half the patients who could not control a power

wheelchair could benefit from using a smart wheelchair with an automated navigational system (for further information on smart wheelchairs see Simpson 2005).

To contextualize the complexities a prospective assistive technology user may face, consider what those patients that would benefit from a smart wheelchair would go through to use one. The patient would need to have knowledge of (smart) wheelchairs, knowledge of how to order one, and the funds to purchase one. As necessary, the patient may need to apply for a funding program for a grant or loan. The patient must also be willing to use a smart wheelchair – willing to learn and use the needed technology, willing to risk the social loss of hired help if the wheelchair replaces them, willing to accept the sick role accompanying specialized assistive technology use. Then the patient would need to find a smart wheelchair that fit his needs and desires. Then the patient needs to obtain the smart wheelchair, learn how to use it, and prepare all planning and upkeep necessary for use of the device. Adoption of assistive technology can be a complicated, expensive, multilevel process.

5. Summary

There are a wide range of devices and services that fall under the umbrella of assistive devices. Domestically and abroad there are governmental calls for assuring the proliferation of assistive device use. While, overall, assistive technology is helpful to individuals there are limitations and care should be given when selecting and using assistive technologies.

The persistent limitations that hassle those of advancing age may not lessen with time, even with assistive technology. Assistive technology helps with dealing with functional limitations, but, cannot cure disabilities. Nevertheless, assistive technologies can be useful tools in the long-term care process to extend autonomy and supplement care-giving.

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