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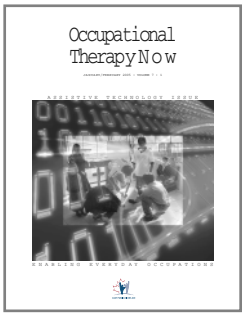

Assistive technology can be as simple as a plywood wheelchair seat constructed in Peru to high-end computer technology.

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Editorial

Elizabeth Steggles

Despite having provided assistive technology (AT) services for many years, I am still fascinated by it. In my role as an occupational therapist, I have assisted clients with equipment choices, been the gatekeeper of funding, worked for a manufacturer and taken part in research and education. More important than all of these, I have also been a consumer. On reflection, I suspect that we are all consumers of AT. For example, at 1.57 metres (5'2"), I often find myself using a spatula to reach a kitchen item that my 1.88 metres (6'2") husband has put out of my reach. AT may be as basic as a re-purposed spatula or as sophisticated as a computer that responds to speech recognition, but if chosen appropriately it can have a huge impact on productivity and quality of life. I think it is the universal nature of AT that lends itself to a theme issue of *Occupational Therapy Now.*

As Mary Clark Green and I planned this issue, the broad scope of AT became clear and it was apparent that we could only scratch the surface of the topic. With this in mind, we have tried to provide a range of ideas that cover a variety of technologies and different aspects of service delivery. I am particularly pleased that we have input both from clinical experts and from consumers who use AT extensively on a daily basis. For example, two consumers of high technology have provided insight into the impact of AT on their lives and shared their enthusiasm for the potential uses of AT. Jim Lenker has outlined how we might measure "what works, for whom, and why," while Laura Titus and Linda Norton discuss some of the challenges of providing wheelchair seating services. Linda Petty gives a wonderful description of the types of technology used by people with visual impairments and the role of occupational therapists in this non-traditional setting. Patty Rigby and Steve Ryan describe what it takes to go from concept to production by explaining how they developed the Embrace pelvic positioner. Another innovative mobility product, the Segway® HT, is described by Christine Polak and Giovanna Boniface.

In this era of funding constraints, we often bemoan the perceived difficulty of providing adequate services, but Dana Corfield's work in Peru highlights how effective simple technology can be and demonstrates how blessed we are to live in a society that values diversity and has so many resources. If you are in any doubt about this you may also read about Rabin Betkhoodoo, a young man with cerebral palsy who came to Canada from Iran.

Despite our good fortune, we cannot afford to be complacent and must consider the potential of new technology. Both Lili Liu and Denise Reid have provided examples of this by describing their use of virtual reality in the therapeutic setting. In addition, Alex Mihailidis and Jane Davis explore the use of intelligent technology as an occupational enabler. I look forward to seeing many more innovative advances in the future.

In the meantime, as you launch into this treasure trove of ideas I hope you will catch at least some of the same fascination that holds my attention. A client recently told me that using her new AT was "like being in love." Please join us in the love affair!

Introduction to assistive technology

Elizabeth Steggles

To begin this theme issue, it may be helpful to step back and consider what assistive technology is and how occupational therapists are involved in service delivery.

Definitions

As I write this, Microsoft's spellchecker does not recognize the word "assistive" but the www.dictionary.com web site describes "assistive" as "designed for use by disabled people." Webster's dictionary describes "technology" as "theoretical knowledge of industry and the industrial arts." Some people consider that the term assistive technology refers to highly sophisticated devices such as voice output communication aids (VOCAs) while others would suggest that a pencil with a large grip is assistive technology (AT). Janice Miller Polgar[1] says that "assistive devices and products range from low technology devices that are relatively simple to construct and use … to more complex high technology devices." I think that US public law provides one of the most comprehensive definitions: "Assistive technology is any item, piece of equipment or product system whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain or improve functional capabilities of individuals with disabilities[2]." Although this definition seems to be fairly widely accepted it is broad and it may be more helpful to try and classify AT.

Classifying AT

Once again the available information is far from clear. Cook and Hussey[3] discuss a number of classifications. They describe low technology as "inexpensive, easy to obtain (e.g., pen & paper communication board)," and high technology as "expensive, difficult to make and difficult to obtain (e.g., electronic communication device)." Scherer[4] describes low technology as "non-mechanical adaptations to existing products (e.g., a pencil grip on a pencil)," medium technology as "those with simple mechanical operations (e.g., a reacher)," and high technology as "those with electronic components or controlled by computer (e.g., a scooter)." Closer scrutiny of both definitions presents problems. For example a big-button TV remote control is inexpensive and easy to obtain but can it be considered low technology? Webster's dictionary describes "mechanical" as "machine made" so a pencil with a grip cannot be described as low technology. Scherer suggests an alternate method of classification by matching devices to the functional limitations of the user. In this scenario, no technology "meets the needs of people with mild functional limitation (e.g., single-foot cane)," low technology "meets the needs of people with moderate functional limitation (e.g., rolling walker)," and high technology "meets the needs of people with moderate to severe functional limitations (e.g., powered wheelchair)." A difficulty once again arises if we consider a person with a moderate hearing loss who may be assisted by a sophisticated hearing aid. Odor[5] suggests categorizing by hard technology, i.e., components that are purchased and assembled and soft technology, i.e., human areas (e.g., decision making, strategies, training and concept formation). The latter classification does not help our understanding of the equipment but it does highlight the need for skilled human support when choosing and supplying AT.

Types of AT

While a definitive classification has yet to be defined, it is possible to discuss the types of AT. Cook and Hussey[6] describe four categories: (a) augmentative and alternative communication; (b) technology that enables mobility; (c) technology that aids manipulation and control of the environment; and (d) sensory aids. With the recent increase in the use of devices such as personal digital assistants, I would add a fifth category: technology that aids memory and organization.

Conceptual framework

Occupational therapists are encouraged to consider intervention within a conceptual framework. One such framework is the Human Activity Assistive Technology (HAAT) model[7]. The HAAT is adapted from the Human Performance Model[8] and is described by Lenker and Paquet[9] as "thoroughly considering person and environment factors, emphasizing the influence of environment and culture on task performance."

Lenker and Paquet also describe the model Matching Person and Technology (MPT) as follows: "The MPT model emphasizes an inclusive, user centered orientation that is reflected in the structure of the model and the manner in which the model is disseminated. Although it identifies numerous person and environment factors … the model leans more toward the descriptive[10]." The World Health Organization's International Classification of Functioning may also provide a framework for intervention as it places emphasis on participation in the environment[11]. In Canada, clinicians may

be more familiar with the Canadian Model of Occupational Performance[12]. This describes occupational performance as "the result of a dynamic relationship between persons, environment and occupation over a person's lifespan."

Role of occupational therapy

Having identified the nature of AT and some theoretical models to guide practice, it is important to take a closer look at service delivery and the role of occupational therapy. Once again we need to look south for a definition. US Public Law states that AT services are "Any service that directly assists an individual with a disability in the selection, acquisition or use of an assistive technology device[13]." Mann and Lane[14] show a diagram of the AT team; the occupational therapist is in the centre of a circle surrounded by case manager, physician, rehabilitation counsellor, rehabilitation nurse, rehabilitation engineer, social worker, speech pathologist, physical therapist, special educator, architect and attorney. All of these people may have a role to play but I believe it is more appropriate to place the client at the centre of the circle with family and caregiver support. Specialists such as the occupational therapist, rehabilitation engineer/technologist, speech pathologist, physiotherapist, special educator, vendor and funder may be included in the team as appropriate to the client's needs. The role of the occupational therapist varies according to the type of AT that is needed but generally the occupational therapist will assist/guide the client by identifying his needs, educating him on equipment options, assisting in identifying the most appropriate options, training in its use and, possibly, by helping acquire funding. When providing more sophisticated technology, it is advantageous to utilize the skills of a multidisciplinary team.

Outcome measures

Jim Lenker addresses the scope of clinical outcomes measurement in AT in greater depth elsewhere in this issue of *OT Now* and I would encourage you to read his article. Interestingly, three commonly used measurement tools were developed by Canadians. These include: Quebec user evaluation of satisfaction with assistive technology (QUEST)[15], the Psychosocial impact of assistive devices scale (PIADS)[16] and the Canadian Occupational Performance Measure[17]. User satisfaction is, not surprisingly, often considered an important outcome element but Longnecker Rust and Smith[18] have recently cautioned, "issues relating to defining and measuring satisfaction are muddled." There is certainly evidence of abandonment of AT[19] and a need for further research into effectiveness is required. This is supported in a position statement published by CAOT[20].

Conclusion

This overview will, I hope, have emphasized the broad range of AT. I also hope that you will be encouraged read more about some of the fascinating activities in which occupational therapists are involved in this very rewarding field of practice.

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Equip K.I.D.S. International: Providing assistive technology in developing countries

Dana Corfield

Occupational therapists are well aware of the role assistive technology plays in enabling people with physical disabilities. In Canada, a wheelchair provides mobility to a person who cannot walk, communication devices provide a voice for people with speech impairments and electronic aids to daily living allow people with all sorts of restrictions to live more independently. It all sounds basic enough, and most Canadians would agree that access to such technology is a human right that every person with a disability should have. But, the truth is, in most parts of the world people with disabilities have no access to assistive technology and are still fighting for basic human rights such as the right to life, liberty and personal security. Try to imagine being unable to walk and having no other way to get around. Try to imagine not being able to speak and having no other way to communicate. Now try to imagine the lives of hundreds of millions of people around the world who live in isolated communities with the challenges of disability being compounded by the challenges of poverty, lack of resources and cultural prejudice.

In Peru, like many other developing countries, people with disabilities are often viewed as a burden and a punishment from God. They rarely leave the house and are often the victims of abuse, neglect and abandonment. Many children with disabilities do not become adults with disabilities, simply because they do not survive. These facts are meant to in-form you, not to depress you, although I know they can be quite distressing. And rightly so. But they do provide some perspective on the lives of millions of people around the world who are traditionally forgotten by governments, development organizations and the international community as a whole.

When I first arrived in Cusco, Peru to volunteer at a paediatric rehabilitation centre four years ago, I was as naïve as most. I was immediately impressed by the lack of assistive technology, rehabilitation therapies and knowledge about disabilities in general. The children at the clinic spent all day in bed and had little interaction with each other or the staff. I didn't know it then, but in many ways these children were the lucky ones, as they were receiving basic necessities such as food, clean clothes, a bed and even occasional physiotherapy sessions. I thought that if I could give the children the assistive devices they needed to compensate for their disabilities, people would realize what they were capable of and would take greater interest in them. So I made it my two-month project to assemble wheelchairs, walkers and seating for the children and to teach the local speech therapist a few things about augmentative and alternative communication. Of course, I understood little of the other challenges people with disabilities in Peru face, but I learned quickly. Four years and a new charitable organization later, I am still working to improve the lives of those same children in Cusco. I now realize that access to assistive technology alone will not rectify the situation. But I also understand better than ever the crucial role that assistive technology plays in improving the lives of millions of people around the world.

Equip K.I.D.S. International is short for Equip Kids in Developing Countries International. It is the organization I founded to help children with disabilities in developing nations, initially focused on providing assistive technology and education. Our focus remains the same today but with the addition of programs that include awareness building and human rights issues, all of which are interrelated. Without an education and essential assistive devices people with disabilities are unable to develop their abilities and fight for their rights. Likewise, without the knowledge of what people with disabilities are capable of and without knowledge of their rights, people with disabilities are unlikely to receive the assistive devices and the education they need. Of course, assistive technology itself takes on a simpler meaning in these situations. We're no longer talking about fancy electric wheelchairs and expensive electronic communication devices. Such things are impractical in developing countries,

where they can't be built, maintained or bought by the families who need them. But many other devices can be developed quite simply, cheaply and, most importantly, locally and can have an immediate and enormous impact on the lives of hundreds, even thousands of people at a time.

In Peru, for example, we can build a child's wheelchair with plywood or from a standard plastic chair for well under $100. A well-built metal chair can be custom designed and produced for around $200. Such a chair would allow a child to get out of the house to play and socialize and to go to school. We can build adapted seating, a walker or put together a communication binder with relatively little effort and resources. It's just a matter of teaching parents and other interested people what can be done, how to do it and the benefit it will have. In developing countries around the world, where rehabilitation is rare and inaccessible to those who need it, family members and friends often become willing physiotherapists, teachers and, above all, occupational therapists. Parents often get very excited to learn that their child could feed themselves or participate in a classroom with just a few modifications to their posture brought about by using household items as assistive technology. It's usually these new-found abilities that motivate previously uninterested parents to seek other kinds of support and therapy for their children, opening up whole new worlds to them. This is the most exciting aspect of working in the international disability field — relatively simple changes can bring about huge, repercussive consequences and can literally change lives.

There are several ways that individuals like you can become involved and make real differences in the lives of children and adults with disabilities around the world. Log onto our web site at www.equipkids.org for some ideas and suggestions on how to become involved. And feel free to contact me with other ideas or to share your experiences. I look forward to hearing from you!

QUICK FACTS

80% of the world's disabled population lives in the developing world.

Over 150 million children with disabilities are growing up in developing countries right now. 97% will never receive the therapy, assistive devices or the education they need.

In many developing countries, children with disabilities regularly die from neglect, abandonment and murder.

Speech-generation device changed my life

My name is Rabin Betkhoodoo and I am 28 years old. I came to Hamilton, Ontario from Iran in 1989. I am Assyrian and my first language is Aramaic. I was born with spastic quadriplegic cerebral palsy and I am non-verbal. In Iran people with disabilities were not allowed to go to school and I did not have any assistive technology, not even a wheelchair. When I came to Canada, I was more than excited to start school and make new friends. My first favourite thing about Canada was pizza — I loved it and I still do! I like the people and all the things I am able to do here. I finished high school in 1996, which made my parents andme very proud. Today, I am hoping to get a job that lets me work on computers, one of my favourite hobbies.

When I first started school, my alternative and augmentative communication team (speech language pathologist, occupational therapist and rehabilitation technologist) made me a picture book to communicate. Later on, the team introduced me to a Touch Talker and then in 1996, they showed me a Dynavox, a speech-generating device. I played around with it for a while and loved it because it allowed me to communicate and make full sentences. I couldn't wait to have it! I use my toe to type because it is very fast and comfortable for me. I have lots of vocabulary programmed and the Dynavox predicts the words I am trying to spell. This is fantastic because my English is not the greatest but I'm still learning!

Before I had the Dynavox, I didn't like to talk to people but now I love talking. I also love working on my computer now that I have a Dynabeam, which sends my words from the Dynavox to the computer. This means I can write e-mails, chat with friends, and write stories and essays. I even play backgammon on the Internet. I also have a mini-dialer, and can make phone calls using it and my Dynavox (the numbers are stored inside). I can talk to whomever I want!

I have lots of ideas about what my Dynavox could do for others and myself. I wish it had a cellular phone so that I could make calls from anywhere. And who says people with a disability can't play soccer? Maybe all we need is a special attachment on the Dynavox! The Dynavox could possibly have a small camera for undercover investigative work – who would suspect that I could be a policeman? It would also be good to have a day planner in my Dynavox so I could keep track of appointments (or parties)!

I don't know what I would do without the help of my Dynavox. It speaks for me and helps me be more independent every day. I can stay in touch with my friends on-line and I can call anyone I want. I love talking to people all the time and without my Dynavox that wouldn't be possible

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From concept to distribution: Developing a new positioning device

Patty Rigby and Steve Ryan

For the past decade, occupational therapists have developed a highly collegial and productive working relationship with rehabilitation engineers and industrial designers at Bloorview MacMillan Children's Centre (Toronto, Ontario) to develop and evaluate new seating technologies for children with physical disabilities. Our new initiatives in seating technologies are based on needs and preferences expressed by consumers and the clinical community we work closely with. Our approach to product development is consistent with client-centred values. We work closely with consumers (i.e., parents and often their children, too), particularly during the early phases of concept and prototype development, to respond to what they desire in the new product, and to what they say works or doesn't work with existing technology and the product under development.

Occupational therapists are well suited to actively partner in the assistive technology (AT) research and development (R&D) process. They bring clinical expertise with special populations and can systematically analyse what is contributing to functional problems, in order to identify design criteria that will address consumer needs and can be used to evaluate design concepts and prototypes. Occupational therapists have effective communication skills for conducting consumer and clinician interviews, focus groups and evaluations during the R&D process. They also have sound knowledge of research methods for inductively exploring consumer and clinician perspectives on AT, and for identifying or designing tools for evaluation of the technology under development. These skills and knowledge make occupational therapists valued members of the R&D team.

In this article, we present one of our new products, the Embrace pelvic positioner (EPP), which helps children with physical disabilities to be positioned better in their wheelchairs. The EPP replaces the role of a wheelchair lap belt by providing superior anterior pelvic stabilization for the seated user (see Figures 1 & 2). The system is designed to improve the seated postural stability of children with spasticity by controlling pathological influences of tone on movement to enable the child with spasticity to use volitional movement for function. The EPP consists of a pair of pads that mount to a wheelchair seating system and hold the user firmly below the anterior superior iliac spines. The pads are adjustable to accommodate mild to moderate asymmetries at the pelvis that are commonly associated with spastic musculature, and are free to rotate about their axes to allow the child to move during forward weight shifting. The EPP should be used on a seating system fitted with a pre-ischial shelf and posterior pelvic support to effectively control movement of the pelvis.

During earlier research, funded through a grant from the Canadian Occupational Therapy Foundation, we demonstrated that our new product, compared to a lap belt, enabled children to be more stable in their seated posture, which consequently improved their ability to become more independent with self-care and productivity, as measured using the Canadian Occupational Performance Measure[1], and reduced their needs for caregiver assistance[2,3].

Recently, we evaluated the effectiveness of the current prototype EPP and developed, tested and evaluated instructions for installing, fitting and using the EPP in community settings to advance the prospects for commercializing this product[4]. In this two-month pilot project, we studied the clinical utility and effectiveness of the EPP. We invited four community therapists who had little to no experience using such a product, to work with their own rehabilitation technology supplier to install and fit the EPP onto an adaptive wheelchair seating system for a young school-aged client. Four children and their parents were enrolled in the study. These therapists assessed the positioning provided by the EPP, and parents and children used the system for up to two weeks. Following the trials, the therapist, parents and children reported their levels of satisfaction with the performance of the device as compared with their existing system.

Feedback from community-based therapists confirmed that the EPP is an effective device for providing anterior pelvic stability for children with spasticity. Parents liked that their children required less repositioning when using EPP as compared to the lap belt. They felt that their children were generally positioned better in their seats and thought that it

Figure 1
EPP positioned over child's upper thighs, below anterior superior iliac spines to provide secure pelvic stabilization in seating.

Figure 2
EPP in open position for child transferring in and out of wheelchair seating system.

was easy to use. Children had similar perspectives. Rehabilitation technology suppliers were confident that they could readily install the devices once they become commercially available. Please see the published paper by Ryan et al. for more detailed results from this study[5].

We made minor modifications to the design and instructions for installation, fitting and use, based upon recommendations for improvement made by parents, therapists and suppliers and our inspection of the seating systems fitted with EPP.

We attended MedTrade (www.medtrade.com) – a major home health-care trade show in the United States – to attract a reputable seating equipment company to license the EPP technology for manufacture and distribution. While at MedTrade, we met with the product manager from BodyTech NW, a small start-up company based near Seattle, WA (www.bodytechnw.com). The company manufactures high-quality wheelchair seating accessories and wanted to expand its current product line to include some new and innovative seating products. The manager felt that EPP was a good fit for its product line, but wanted to evaluate the manufacturability and marketability of the product. We agreed to provide the company with a prototype of the EPP along with detailed engineering drawings, workshop manuals, user instructions and results of our research under a non-disclosure agreement.

Following a 60-day evaluation period, BodyTech NW expressed a strong desire to manufacture and distribute the device through the company's growing dealer network. We agreed to basic licensing terms that laid out the roles and responsibilities of both parties, particularly as it related to royalties, ownership, marketing, distribution and exclusivity of the product. We had our lawyers prepare a legal contract using these agreed-upon terms as a foundation, and authorized representatives of both parties signed the document.

The Embrace pelvic positioner was subsequently launched as a new seating product in September 2003. Plans are underway by the company to list the EPP as an approved positioning product with the Assistive Devices Program in Ontario.

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Virtual occupations create opportunities

Denise Reid

Virtual reality (VR) comes in many forms. There are desktop PC versions, head-mounted display systems and projected systems. Our research at the University of Toronto uses a projected system. The Mandala, Gesture Xtreme IREX VR system*, developed by Vivid Group Inc., uses a video camera as a capturing and tracking device to put the user inside VR experiences. The user sees himself on a TV screen and the virtual environment responds to his movements. The user does not have to wear, touch or hold anything. Through the use of the system's "video gesture" capability, the movements (e.g., reaching, bending) trigger visible or invisible icons to score points, and manipulate animations (e.g., playing a virtual drum kit, juggling balls, painting a picture or playing soccer). See Figure 1 for an example.

Children with cerebral palsy experience barriers that limit their ability to participate in many play activities. Older adults recovering from strokes have lost the ability to participate in a variety of leisure activities. The VR technology in our lab provides them with opportunities for play/leisure occupational engagement.

Although our aim is to provide an experience, our research explored the benefits of VR for people with disabilities. First, we found that it improved people's self-efficacy[1]. Children reported being better able to do things in their everyday life after experiencing VR for a period of eight weeks. In another study we found changes in upper extremity movement[2] and posture[3]. They performed movements faster and with better movement patterns, and elements underlying their postural control such as tone, alignment, balance and proximal stability were improved.

Figure 1. VR environment of soccer.

*Vivid Group, 317 Adelaide St., Toronto, ON. M4V 1P9 www.vividgroup.com

The motivational impact of VR on clients was very interesting. Both children and adults who survived strokes scored as highly motivated after experiencing VR[4,5]. The sorts of behavioural indicators of motivation we found include shows curiosity, stays engaged, tries to solve problems, pretends and shows perseverance. We also found that children experiencing VR were quite playful as measured with the Test of Playfulness[6].

Several theoretical concepts can explain these findings[7]. Flow[8] helps to understand the pleasure and state of complete absorption while being immersed into the virtual world. Another concept is presence. This is state of consciousness, of "being there[9]". Interacting with a virtual environment can create a sense of physical reality for the person. We also observed entexturement, an anthropology concept that describes an individual's awareness of his body in respect to a variety of media with different sensory textures such as space, light, colour, visual imagery, activity, rhythm, content, pace, ambiance and sound[10]. Entexturing may be thought of as an individual's regulation of activity, of aural and visual stimuli, and colour, and other sensory media that surround the body in order to produce, if possible, a finely articulated and satisfying whole. The virtual environment allows the user to change the colour, shape and sounds by interacting with it.

At the present time there are few facilities that have invested in a VR system that individuals can access for recreational purposes. There are systems available from Sony Play Station that deliver similar experiences, right in the home, but they lack the benefits of background virtual environments. The Graduate Department of Occupational Therapy at the University of Toronto has VR facilities. Contact me about participating in ongoing research.

About the author

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Technology makes 24-hour assistance unnecessary

Each of us is unique. I could, however, easily find a group of 100 able-bodied individuals who could perform a list of 10 tasks with ease. I do not speak of underwater welding or nuclear physics. I refer to the daily, mundane tasks that most people accomplish without a struggle, such as opening doors, changing television channels or dialling the telephone. For people with disabilities, the challenge of such activities is compounded by incredible differences in abilities and a range of unique interests. Given these considerations, you're beginning to understand what's required of the assistive devices in my wheelchair-bound world.

I have very little use of my limbs and was told that my personal medical condition required 24-hour supervision, seven days a week. However, as I dictate this article, using my voice-activated program, I am alone. It has taken much insistence on my part, the assistance of specialist health-care professionals and the computer age for this to happen.

From my current position, facing a 21-inch computer screen with enlarged text font, I can monitor my front door by means of an outside camera that is connected to the television cable into the back of my computer. The image is displayed on a small corner of my screen as I work. If I recognize a friendly face at the door, I can open it by means of a remote-control TouchScreen. I can also exit my home independently and seek assistance from my neighbours if necessary. Using the TouchScreen, I can make and receive calls on my speakerphone. My wife carries a cell phone so that I can contact her when she's out but it's mostly for her peace of mind, not mine. If I find computer tasks becoming tedious, I can activate my stereo and television or play a DVD. I can even program our VCRs to tape programs for later viewing. I also have control of most of the lighting and my elevator.

I have spent most of today teaching my sister how to operate her new digital camera and coordinate her photographs on the computer. Photography is one of my passions. I purchased a digital camera with a remote control about a year ago but found that I could not use it; independent picture taking seemed impossible. I have, however, now taken many posed and candid shots using a modified Tash Mini Relax that replaces the remote control. The camera is on a special mount.

Damage to my vocal cords during surgery left me searching for a portable voice amplifier. A recent $60 purchase from a local electronics store has remedied this situation. It is very useful during noisy social gatherings or securing the attention of store clerks. My current electronic quest is for an intercom system to enhance our video surveillance. The old-style push bar buttons allow me the most physical control but the distance seems limited. No doubt there are solutions available to this and other problems but I have yet to discover them. I'm sure I will.

— Robert Havens, Freelance Writer, Owen Sound, ON

You may contact Robert by e-mail at: rghavens@sympatico.ca or visit his web site at: www.bobalong.ca

Research into assistive technologies

A call for descriptions of research led to the following project highlights.

Outpatient Seating Clinic Program Evaluation

An improvement-oriented program evaluation was conducted in an outpatient seating clinic program for adults living in an urban area. The evaluation aimed to discover strengths and weaknesses related to program processes. The research used a purposeful sample of seven provider stakeholders of the seating program to answer the question: "What are the perspectives of the provider stakeholders regarding the strengths and weaknesses of the processes used by the seating program?" Data collection occurred using two methods: (a) a qualitative pencil and paper questionnaire; and (b) a semi-structured interview.
Questionnaires were distributed to all seven participants for completion. Analysis of the questionnaires showed that the intake process was identified by all seven stakeholders as requiring improvement. This process, therefore, became the focus of the interviews. Seven semi-structured interviews were conducted. The data from these interviews were analyzed using qualitative content analysis. The preliminary analysis showed that the referral form, prioritization and screening processes related to intake required improvement. The data from this research will assist this program and others like it in targeting efforts at maintaining strong processes and improving weak processes related to intake for seating programs.
Research team at University of Alberta Principal investigator: Bethany Hutchinson, e-mail: bah@ualberta.ca; co-investigators: Dr. Vivien Hollis, Dr. Al Cook, Shaniff Esmail and Nilima Parikh.

Teen Psychosocial Impact of Assistive Devices scale (T-PIADS)

The overwhelming majority of children with special needs who receive rehabilitation services will use one or more assistive technology devices (ATDs) over the course of their lives. They include devices designed to help children communicate effectively and improve their mobility so that they can participate in academic and social activities in the school and community. But we know very little about how children and their caregivers regard the contribution made by these devices to a child's health and well-being in the short and long terms. Research is needed to improve our understanding of how ATDs are perceived to affect the quality of life (QOL) for children who have a physical disability. The Psychosocial Impact of Assistive Devices Scale (PIADS) was developed to measure the impact of ATDs on subjective perceptions of independence, psychological well-being and QOL. The purpose of this study is to adapt PIADS, a questionnaire designed for adults, for use with teenagers. The Teen Psychosocial Impact of Device Scale (T-PIADS) is part of a program of research to develop a reliable and valid measure of the impact of assistive device on a teenager's psychosocial well-being and subjective QOL.
Research team: Principal investigator: Jeffrey Jutai, e-mail: jjutai@uwo.ca; co-investigators: Joe Bortolussi and Elizabeth Steggles.

How effective are bath grab bars for stopping a fall when you lose your balance?

Encouraging the use of bathroom grab bars for safe and independent bathing has been an important component of some recent falls prevention programs. Yet no study has actually examined the effectiveness of these devices and how useful they are in regaining stability or preventing a fall when balance is lost during bathtub entry/exit. This study, funded by the Canada Mortgage and Housing Corporation, will examine the effectiveness of four different bathtub grab-bar configurations (no bars, vertical/horizontal, vertical/angled, right angle) when a loss of balance occurs, and to identify barriers to their acceptance and use with 60 adults (50-60 years old).
Research team: Dr. Paulette Guitard, e-mail: pguitard@uottawa.ca; co-investigators: Dr. Heidi Sveistrup, Dr. Nancy Edwards and Dr. Donna Lockett.

Research in Academic Technology

The Adaptive Technology Resource Centre conducts research and develops software for people with disabilities to enable participation in tele-learning, communication, creating accessible tele-educational material and other computer-based activities.

A-Chat is a web-based chat tool that was designed with accessibility in mind. Free download from http://achat.atrc.utoronto.ca/

ATutor is an Open Source Web-based Lear-ning Content Management System (LCMS) designed with accessibility and adaptability in mind. www.atutor.ca

ACollab is a fully accessible, open source, multi-group, web-based collaborative work environment. www.atutor.ca/ acollab/

GOK (gnome onscreen keyboard, an open source project) enables users to control their computer without having to rely on a standard keyboard or mouse. www.gok.ca

The Inclusive Learning Exchange (TILE) is a revolutionary learning object repository service that responds to the individual needs of the learner. http://inclusivelearning.ca

The Barrierfree Learning Environment toolset takes a story captured in linear video and links a wealth of information, enhancements and perspectives using a synchronized text track derived from the caption and audio description of the video. http://barrierfree.ca

Jutta Treviranus, BSc(OT), MA, Director, Academic Technology Resource Centre, University of Toronto, e-mail: jutta.treviranus@utoronto.ca and Linda Petty, BSc(OT), OTReg(ON), Clinical Specialist, ATRC, University of Toronto, e-mail: linda.petty@utoronto.ca.

Product Review

Segway® Human Transporter (HT)

Price:
$3,995 USD
Available at:
Segway Northern Alberta or Segway of Prince Edward Island
www.segway.com

This mobility device was made available to the public approximately 14 months ago and is a self-balancing personal transportation system. The Segway HT can self-balance because of a technology called dynamic stabilization. Dynamic stabilization consists of gyroscopes, tilt sensors, high-speed microprocessors and powerful electric motors performing to keep it balanced. Working in concert, redundant systems sense a person's centre of gravity, instantaneously assess the information and make minute adjustments 100 times a second. The Segway HT was designed using the human vestibular system as its model and can travel speeds up to 12.5 km/hr.

There is no accelerator or brakes with this system. When you lean forward, you move forward. When you straighten up, you stop. When you lean back, you move back. To turn, you rotate the steering grip under your wrist in either direction.

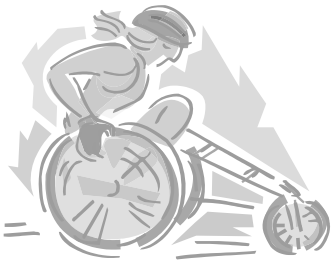
The Segway HT is designed for use on a variety of terrains, indoors and outdoors. By using it as a transporter, you can ride in congested cities for up to 20 kms of travel distance on one battery charge, providing an alternative to public transport. Segway HTs are popular with students as campus transporters; employees of large institutions and local shoppers picking up small items, and may be enjoyed simply as a recreational vehicle. As an indoor device it can make tight turns within small spaces such as elevators.

Riders, however, must have good dynamic standing balance, good visual perceptual skills and the ability to learn how to safely mount and dismount the eight-inch-high platform. As well, in Canada, there is no legislation in effect to regulate the use and operation of the vehicle, and as such, a Segway HT cannot be legally operated on roadways or sidewalks. Presently they are available for rental in a recreational area of Vancouver, BC.

— Christine Polak and Giovanna Boniface, private practice practitioners, Vancouver, BC.

AT outcomes research: Important considerations for conducting clinically relevant studies

James A. Lenker



Clinically based assistive technology (AT) outcomes research attempts to answer a fundamental question: "What works, for whom, and why?" Implicitly, this suggests that we can relate treatment interventions (i.e., "what"), measured outcomes (i.e., "works"), and the target population (i.e., "for whom") in a manner that supports or challenges treatment theories (i.e., "why"). This article identifies important variables and approaches to measurement, for three of these four essential components of outcomes research — i.e., treatment interventions, target population and outcome variables.

Measuring AT treatment interventions

Although increasing attention is being paid to outcomes measurement, relatively little discussion has been devoted to capturing the nature of AT interventions. Clearly the quest for evidence-based AT practices dictates the need to identify the "active ingredients" of our AT interventions so that we can provide services that are as effective and efficient as possible. Measurement of these AT treatment factors is also crucial for correct interpretation of outcomes research.

Specification of AT treatments is messy. The AT field is notorious for the heterogeneity of key treatment factors: AT device, service delivery methods, practitioner background and skills, treatment setting, reimbursement context, treatment practices and presence of concurrent interventions.

AT devices include aids for self-care, mobility, communication, and environmental safety and control, among others. Most devices require assembly, fitting, and/or configuration by an AT practitioner in order for the user to experience maximum functional benefit. AT services are rendered by professionals with a myriad of backgrounds: Occupational therapists (OTs), physiotherapists (PTs), speech-language pathologists (SLPs), special educators, rehabilitation engineers, human factors engineers, architects and information technologists. Most provide AT services as a small component of their everyday work responsibilities; few received systematic instruction about AT while in school. Some have taken continuing education at conferences and workshops; others have obtained one of the advanced professional certifications offered by the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA).

AT treatment settings include schools, homes, hospitals, nursing homes and employment settings. Funding criteria for AT devices and services vary with the reimbursement entity. Some agencies support only those AT devices and services that improve functional or physiologic indicators (i.e., the medical model); for other funding agents, AT must demonstrate positive impact on school performance (i.e., the educational model); others base funding decisions on the work-related benefits of AT (i.e., the vocational rehabilitation or employer model).

There are no standards of AT practice for any of the above AT settings or reimbursement agencies. In addition, practitioners frequently include modifications to tasks and environments as part of their AT services. These "concurrent interventions" may support use of AT or perhaps improve unaided functional performance.

Each of these factors — device, practitioner, treatment setting, reimbursement context, treatment practices, and presence of concurrent interventions — is a potential active ingredient that affects the results experienced by end users of AT devices.

Historically, the AT outcomes literature has not described these factors well, which offers both bad news and good news to present-day clinical researchers. The bad news

Typically, AT outcomes research does not classify participants in terms of distinguishable sub-groups, which minimizes our ability to infer the impact of population differences on outcome variables.

is that we have no existing standards for measuring AT interventions in their totality. The good news is that almost any attempt to specify these factors will enrich our research literature. I recommend the following for consideration when reporting the "what" of clinical AT outcomes research.

Specifying the AT device, concurrent interventions, treatment process and treatment structure (the "what")

AT devices can be described in terms of:

- Device category (e.g., wheeled mobility, augmentative communication, computer access and accommodation, environmental control units);
- Device function (e.g., mobility, written communication and self-care);
- Device features (e.g., rear-wheel-drive versus mid-wheel-drive powered wheelchairs);
- Context of device use (e.g., home, community, school or work); and
- Presence of concurrent interventions (e.g., modification to task and environment).

The AT treatment process includes several measurable factors:

- Nature of the AT services (e.g., assessment, device recommendation, reimbursement advocacy, training, device adaptation or configuration and technical support);
- Intensity of service (i.e., the number of hours per session);
- Frequency of service (i.e., the number of sessions per week);
- Duration of service (i.e., total number of sessions); and
- Inclusion of diverse team members (e.g., family members, equipment vendors and multiple practitioner disciplines).

AT treatment processes can be further specified in terms of practitioner-related indicators:

- Practitioner discipline (e.g., OT, PT, SLP, special educator or engineer);
- Practitioner experience (e.g., number of years);
- AT-specific expertise (e.g., continuing education in AT and/or advanced certifications in AT); and
- Service delivery model (e.g., team approach versus practitioner working alone).

There are a number of potentially relevant treatment structure factors which follow.

- *Percentage of full-time equivalent (FTE) staff devoted to AT services.* Sites with a high percentage of FTE staff devoted to AT might, over the long term, have the opportunity to develop greater expertise and proficiency in providing AT services.
- *Reimbursement model* (e.g., medical, educational, vocational or community). Often the constraints of reimbursement dictate the approaches to AT treatment.
- *Treatment setting* (e.g., school, home, hospital, nursing home, or employment). As with reimbursement, the treatment setting can have a great effect on the approach to AT interventions.
- *Geographic region* (e.g., province) and population density (e.g., rural or urban). Outcomes comparisons based on region could reflect differential impacts of provincial policies, presence of unique centre-based expertise, innovative community-based programs or progressive em-ployers.

Many factors described above can be used to compare distinguishable sub-groups of users. As an example, clinical researchers might compare quality of life impact for users of two types of mobility aids (e.g., wheeled mobility versus walkers), rather than the more typical scenario in which AT users are pooled together in a single generic category (e.g., "device users" or "mobility device users"). Such specificity would yield nuanced interpretations of study results that would establish treatment causality.

Importance of treatment specification

If measured and reported systematically, device, process and structure factors would be tremendously informative for clinicians seeking information that is relevant to their own practice settings. Even if not measured systematically, descriptive reports of these factors would provide useful contextual clues that would facilitate clinical interpretation of findings — i.e., "How does this research study relate to my everyday practice?"

Measuring population (the "for whom")

Population factors are characteristics of the participant sample that may explain differences in outcome variables[1,2,3]. Typically, AT outcomes research does not classify participants in terms of distinguishable sub-groups, which mini-

Quality of life (QOL) impact is perhaps the most important outcomes indicator from the AT device user's perspective.

mizes our ability to infer the impact of population differences on outcome variables.

continued >

Specifying population

I recommend the following population factors for consideration when reporting the "for whom" of clinical AT outcomes research.

- Age, gender, living status (alone, spouse/relative, assisted living, group home) and location (rural/urban).
- Type of disability.
- Severity of disability (e.g., assistance required for aids/independent aids to daily living).
- Age of disability onset.
- Perceived need for AT.
- Enthusiasm for AT.
- Number of months since current AT was obtained.
- Previous experience using a similar type of AT.
- AT device skill (e.g., novice, expert).

As an example, researchers might study whether *perceived need for AT*, measured at the time of assessment, is predictive of long-term AT usage. Others could evaluate *age of disability onset* as a predictor of AT acceptance. At a minimum, AT outcomes researchers should design studies in which participants are divided into comparison groups so that differential outcomes can be evaluated.

The importance of specifying population

As with treatment specification, systematic capture and reporting of population factors would be greatly appreciated by clinicians seeking information that is relevant to their own practice settings, as well as researchers attempting to develop testable hypotheses to confirm treatment theories.

Measuring outcome variables

Outcome variables represent the impact of AT interventions — i.e., how well the interventions "work." Without the potential for positive impact at some level, there is no incentive for the end user, payer or practitioner to engage in the long and arduous process of AT device provision. Typical AT outcomes domains include: use, usability, quality of life impact, role performance and cost.

Measuring use

Usage has often been measured dichotomously in terms of use and non-use (so-called "abandonment"). Additional dimensions of device usage are also meaningful and include frequency of use, duration of use, environments of use and tasks for which a device is used. These dimensions have appeared sporadically in the AT device outcomes literature and have been measured inconsistently, making it difficult to compare usage data across studies[4].

Measuring usability

Usability is defined to include the effectiveness, efficiency and user satisfaction associated with use of a particular tool or product.

Measuring objective aspects of usability

Several performance-oriented tools exist for measuring objective AT device usability. COMPASS[5] is a software program that assesses keyboard and mouse performance. Several sophisticated pressure-mapping tools are available for evaluating the effectiveness of wheelchair cushions. Other tools are being developed to measure functional skills of wheelchair users[6,7].

Measuring subjective aspects of usability

Subjective aspects of AT device usability are tapped by the Quebec User Evaluation of Satisfaction with assistive Technology (QUEST)[8], Psychosocial Impact of Assistive Devices Scale (PIADS)[9], and the Device Section of the Assistive Technology Device Predisposition Assessment[10]. Each offers strengths with respect to measuring subjective aspects of AT device usability. Other facets of usability are also pertinent: physical and cognitive effort, aesthetics, hassles, learnability, dependability, discomfort, speed, accuracy and reasons for continued use or non-use[11].

Quality of life

Quality of life (QOL) impact is perhaps the most important outcomes indicator from the AT device user's perspective. QOL domains include health-related quality QOL, health status, quality adjusted life years, material status, social relationships, and subjective well-being[12,13,14,15,16,17]. The Psychosocial Impact of Assistive Devices Scale (PIADS)[18] is a 26-item scale that measures the impact of AT devices on the subjective well-being of AT users. The Assistive Technology Device Predis-position Assessment[19,20] includes a sub-scale that correlates positively with the Satisfaction with Life Scale[21].

Role performance

Cost may be explicitly measured in monetary terms or expressed in terms of surrogates such as caregiver time.

Indicators of social role participation include activity patterns, location of residence, employment, education (e.g., academic standing, workload or writing quality), users' overall goals and unmet needs.

Cost

Cost is typically measured in terms of costs associated with devices, services, reduced assistance and deferred health care. Cost may be explicitly measured in monetary terms or expressed in terms of surrogates such as caregiver time.

Choosing outcome variables and measurement tools

Ultimately, the choice of outcome variables is driven by one's research hypotheses. One should choose measurement tools that are reliable, valid, efficient to administer and appropriate for one's study population, among other considerations.

Discussion

A number of authors[22,23,24,25] have suggested some rather appealing benefits that would result from improved specification of treatment and population. For starters, it could help researchers form more precisely articulated hypotheses. Secondly, practitioners would find it easier to extract information that has bearing on their own clinical practices. Third, researchers would find it easier to replicate, and build upon, previous research of others. Fourth, comparisons across settings and populations would be facilitated. We could also identify the effects of organization and government policy changes on AT outcomes. Fifth, we could establish a set of routinely gathered clinical data, which could be maintained in an electronic record that could perhaps be linked nationally, as has been done with FIM data. Last, but certainly not least, would be the potential to develop and refine AT treatment theories.

Conclusion

There is a growing emphasis on measuring outcomes in order to develop evidence-based practices that reflect research conclusions regarding, "what works, for whom, and why." However, outcomes *measurement* should not be confused with outcomes *research*. In our rush to collect outcomes data (i.e., "works"), clinical researchers are encouraged to include measures of variables, i.e., "what" (indicators of structure and process) and "for whom" (indicators of population). Without the latter, we are limiting our ability to draw meaningful conclusions — effectively selling short our collective research efforts.

About the author

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Seating clinic networking opportunities

Laura Titus and Linda Norton

Wheelchair and seating services have expanded rapidly in response to the growing needs of clients, especially those with complex seating issues. One avenue of service that has evolved in response to this demand has been the seating clinic. Seating clinics have grown out of the need for centralized, specialized knowledge of complex wheelchairs and seating. Most seating clinics are affiliated with a health-care facility but operate in a variety of forms and under a variety of operational constraints. These clinics provide an avenue for therapists and clients to access expertise regarding complex wheelchairs and seating, but often seating clinic therapists work in isolation with limited peer support and networking opportunities.

Through the collaborative efforts of the seating clinics from Parkwood Hospital in London, Ontario and West Park Health Care Centre in Toronto, a workshop was offered at the 2003 Canadian Seating and Mobility Conference. Seating Clinics: The Good, the Bad and the Ugly was an interactive forum for seating clinic therapists to discuss the operational aspects of seating clinics. During the workshop participants had the opportunity to complete a survey and then discuss areas they felt were priorities. The domains addressed by the survey and in the workshop are summarized below. There were approximately 25 participants and 17 surveys were collected at the end of the workshop. Of the 17 surveys collected, 14 were from clinicians and three were from manufacturers/vendors. The clinician survey information was used for this article.

Practice issues

Staffing

All survey respondents indicated they provide wheelchair/seating services through a formal seating clinic. The clinics' operations vary, especially with regards to staffing allocations. Full-time equivalents range from 0.4 to 7.0 with 64% of clinics operating with a greater number of occupational therapists than physical therapists. Six respondents (43%) indicated there are only occupational therapists at their clinic. Seventy-nine percent of clinics receive additional support from either therapy assistants, administration or technicians. Of this number, 18% (two clinics) have more than one type of other staff support. See Table 1.

Table 1 Staffing allocations

Full-time equivalents

Range	Raw #	Percent
<0.5	3	21
0.5-1.0	6	43
>1.0	2	14
Not indicated	3	21

OT/PT complement

	Raw #	Percent
OT only	6	43
OT&PT	4	29
PT only	1	7
Not indicated	3	21

Provision of service

Forty-three percent of survey respondents indicated they spend at least 75% of their time in direct care with the client. Ten respondents (71%) indicated they provide consultation services to community therapists and/or therapists within their own facilities but indicated that those consultations take less than 10% of their time. There was one exception who indicated that consultation makes up 40-50% of his/her work time. See Table 2.

Table 2 Service provision

Percent of direct client involvement

Range of time	Raw #	Percent
>75%	7	43
50-75%	4	29
<50%	1	7
Not indicated	2	14

Not surprisingly, the waiting list was indicated as the number-one frustration of seating clinic therapists.

Admission criteria

Nine out of 17 (53%) survey respondents indicated they have formal admission criteria; five (29%) indicted they do not and two did not provide a response to this question (12%). Common types of criteria included a doctor's referral, age limitations and an Ontario provincial health card. Only one indicated that clients must have complex seating and mobility needs but did not expand on how they define complex. One respondent indicated that clients must have a primary occupational therapist within their facility or the community to be referred.

Frequency of visits

The number of visits to complete the process from assessment to discharge/closure also varied greatly from one to seven visits. The length of time for each visit was not asked but it would be interesting to gather data regarding the total length of time it takes to complete the process. Given the variations in operation and factors such as the travel time of clients to clinics, total time may provide a better comparison value than frequency of visits. See Table 3.

Table 3 Frequency of visits

Number of visits from assessment to discharge/ closure

Range	Raw #	Percent
<2 visits	1	7
2-5 visits	8	57
>5 visits	2	14
Not indicated	3	21

Number of visits per month

Range	Raw #	Percent
<25 visits	3	21
25-50 visits	5	36
>50 visits	2	14
Not indicated	4	29

Discharge

Eight of 17 respondents indicated they do not discharge clients from their caseload (47%); seven indicated that they do and two didn't respond to this question.

Documentation

Eighty-two percent of respondents indicated they have some type of formal documentation processes in place. Thirteen out of 17 indicated they have a formal assessment form (76%), while only five indicated they have a formal discharge form (29%). Most respondents indicated that they communicate with the referral source but it is usually by telephone. Ninety-two percent indicated they document all interactions with clients.

The documentation methods vary from handwritten notes, chart notes and forms to a palm pilot. When asked if they had found any methods to make documentation more efficient or effective, the only suggestions listed were template forms for funding letters and equipment, and on-line databases.

Sixty-one percent of clinics do not send follow-up/discharge reports to the referral source. One clinic indicated they use one final assessment, which can be sent to the funding agencies, but is also used to meet the documentation requirements of the employer.

Workshop participants expressed frustration with the amount of documentation required, and that the documentation required for funding is often different than that required by the facility or employer. Considering these issues, it is not surprising that participants listed documentation as the third most common source of frustration.

Wait lists

Wait list lengths varied from none to 12 months. Eighty-three percent of respondents indicated that there are ways to prioritize clients for special needs such as skin issues, acute medical issues and safety issues, but how it is done is vague. Only one respondent provided reference to a formal prioritizing process. Not surprisingly, the waiting list was indicated as the number-one frustration of seating clinic therapists. However, there was little discussion about waiting lists during the workshop, seemingly because wait lists are dependent on the seating clinic location, population served and staffing constraints. Limited discussion may have been due to the therapists' perception that there is little they can do to alter the wait list.See Table 4.

Table 4 Wait lists

Wait list length

Range	Raw #	Percent
<1 month	6	43
1-3 months	4	29
4-6 months	1	7
>6 months	2	14
Not indicated	1	7

The documentation methods vary from handwritten notes, chart notes and forms to a palm pilot.

Education

The participants were asked if they provide educational opportunities to others. Only three responded in the negative. Most clinics (67%) conduct informal daily education to family, staff, teacher's aides, caregivers, as well as formal education to staff, peers and the local community college assistant programs. The frequency and the length of the educational opportunities were not indicated. The survey also did not ask participants how they were meeting their own educational needs and if they felt it was adequate. However, responses in the frustrations section of the survey indicated that perhaps there are gaps in educational opportunities for the experienced, knowledgeable seating therapist. Further investigation would enable better comparisons.

Outcome measures

Outcome measurement was identified by most participants as a priority for discussion at the workshop but few people identified they had outcome measures with which they were satisfied and felt met their needs. It was, however, interesting that in the survey, outcome measures were not even once listed in the "frustrations with seating clinics" part of the survey.

In the survey, standard documentation such as power checklists, regular reports, standard forms as well as digital cameras and pressure mapping were listed by participants as methods of measuring outcomes. Other less-frequently indicated measures included a satisfaction survey, follow-up phone calls, and tracking of process (i.e., wait list, number of visits, etc.). One clinic tracks each client's progress through the process. In this way they can keep track of and follow up on key indicators such as time to obtain quotes, and time to get responses from funding agencies.

Summary

At the end of the survey, participants were asked to identify the things about their seating clinic that frustrate them and the things they enjoy most. Frustrations listed included more clinically based issues. Wait lists were the number one frustration, followed by process issues, documentation, education – mainly their own, and funding issues. Most enjoyable aspects in seating clinics included, by far, the contact with clients and seeing them satisfied. The other things listed included: flexibility, creativity and problem solving, challenge, and innovation and creativity.

What stood out from the surveys and the workshop is that no matter how differently seating clinics operate in regards to wait lists, full-time equivalents, number of visits, etc., the therapists who work there deal with similar challenges and enjoy similar things about working in seating clinics. Feedback received indicated that most seating clinic therapists would like to have more opportunity to discuss the operational issues they face with other seating clinic therapists. Many feel they work in isolation to some degree, and would welcome the opportunity to discuss issues such as outcome measures, methods of more effective documentation and methods of service delivery.

Join the listserv

A listserv has been started by the authors, the intent of which is to decrease the isolation experienced by therapists working in seating clinics by providing a networking opportunity. To join please go to www.coollist.com and click on join, then on seating clinics.

About the authors

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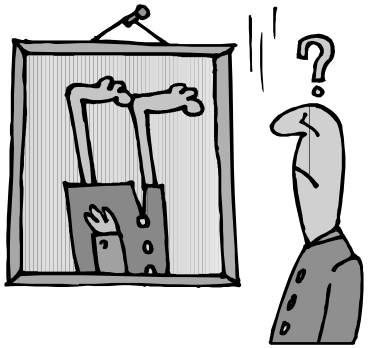
The potential of intelligent technology as an occupational enabler

Alex Mihailidis & Jane Davis



We live in a world where people are becoming increasingly more dependent on devices to do their daily occupations. This technological reliance is not a new phenomenon; it has been with us throughout history. Beginning with the first development of tools to facilitate the performance of basic survival occupations, there has been a relentless search for new technologies. From the arrowhead, to the leaf blower, to the personal digital assistants (Palm Pilots™), history has seen the continuous development of devices that enable people to perform the many different occupations that fill their world. Over the past few decades, in particular, advances in technology have changed the look of many of the things that we do. Interestingly, the increasing reliance on technology has seen many devices, originally used only by individuals with disabilities, become mainstream, such as ergonomically designed pens and gardening tools, grab bars and electric toothbrushes. These devices have come into everyday use as individuals have recognized their benefits to occupational performance.

In concert with the increasing dependence on devices among the general population, occupational therapists are using assistive devices as key occupational enablers. More and more, high-tech assistive devices are being added to the occupational therapy toolbox to enable individuals to live more comfortably and be less dependent on others in carrying out everyday occupations. New developments in high-tech assistive devices, such as intelligent technology, are making it possible, for the first time, to adapt the technology to the individual, thereby enabling the occupational performance of individuals in context. This possibility holds amazing potential for individuals who wish to age in place and live fulfilling occupational lives.

Advancements in intelligent technology are making it possible to consider using it to compensate not only for the physical limitations of an individual but also for the cognitive limitations and for contextual barriers. Cognitive impairments of body structure and function can lead to occupational disruption and dysfunction and result in significant activity limitations, restricting full participation. This, in turn, can lead to greater demands on an individual's caregiver and the health-care system. New high-tech assistive devices have demonstrated potential to influence the occupational performance of individuals with cognitive deficits.

Research being carried out using intelligent cognitive orthoses, such as COACH, with individuals with dementia is providing evidence for the potential of such devices to support performance, and reduce dependency on caregivers in the performance of self-care activities:

> *COACH — Cognitive orthosis for assisting activities in the home, is an intelligent computerised device that was developed to assist people with dementia complete ADL with less dependence on caregivers. It uses artificial intelligence algorithms and a single video camera to monitor progress and provide pre-recorded verbal prompts as necessary*[1].

Since different individuals perform occupations in different ways, any device used to enable occupational performance must be able to adapt to individual users. The intelligent nature of COACH allows the technology to adjust to the idiosyncrasies of the user's occupational performance, by creating commands that are based on the learnings from previous uses of the technology by the individual, i.e., the technology learns to adapt to the specific performance idiosyncrasies of each user.

Intelligent technology has the potential to be context-aware, where context includes many different aspects of the physical and conceptual environment, and the person using the technology. For example, time and place are two important factors that must be considered by an intelligent technology if it is to assist a particular person in the execution of an occupation[2]. As well, personal factors about the user, such as who the user is, what his/her preferences are and what he/she

has done in the past, are important aspects of the context that need to be considered by the assistive device. This context can be used to interpret explicit acts by the user in order to develop a natural-fitting strategy of action, whether it is a rehabilitation program being developed for a particular client, or a computerized device trying to determine actions to take, as is the case with COACH. The inclusion of a contextually aware model in new assistive technologies will be critical in improving their performance and efficacy, and hence, in improving their overall acceptance by current and new users.

The findings of a study conducted with COACH[3] provide interesting insights into the potential of intelligent technology to enable occupational performance among individuals with dementia. Nine out of the 10 individuals with dementia who participated in the COACH study improved their task performance and completion during handwashing, demonstrating that intelligent cognitive orthoses could enable occupational performance. This potential for improvement in task performance could offer individuals opportunities for having a less dependent role in their occupational performance, by increasing retention of, or enabling improvements in, the initiation and completion of tasks. This, in turn, may allow for increased privacy during the performance of self-care occupations. Individuals with cognitive deficits deserve privacy in their performance of occupations as much as anyone, yet it is often compromised because of their need for frequent cuing. High technology has great potential to provide this level of independence for individuals. As a secondary effect, COACH has the potential to provide some relief for family caregivers who in the absence of COACH must provide constant cuing to enable their loved ones to perform. Thus, COACH can reduce the reliance on caregivers and the infringement on privacy, which can cause role reversal, discomfort and embarrassment for the caregiver and user alike[4].

Work with COACH has also demonstrated the influence of the interaction of context, person and occupation on individual occupational performance. The speed and frequency with which a caregiver or COACH provided task prompts for each individual was found to alter their opportunities for engagement in the occupation of handwashing. In some instances the prompts came too fast, resulting in decreased self-initiation of tasks, i.e., steps making up the occupation, which could have long-lasting effects on the occupational performance of individuals with cognitive deficits. Also the voice from COACH demonstrated potential to cause an increase in agitation or confusion in some individuals. Gaining a better understanding of how high-tech devices, especially ones that can be perceived as invasive, are experienced by individuals, will help perfect the application of these devices in everyday life.

High-tech devices, such as intelligent cognitive orthoses, have great potential to recognize the idiosyncrasies of the occupational human, providing new knowledge about the complexities inherent in occupational performance and helping to make sense of doing. "Adaptation [sic] through experimentation is the driving force of technological evolution, just as adaptation per se is a central tenet of evolutionary theory; and 'a new discovery does [sic] not have to find its relevance immediately[5]' but can provide "a new solution" to some future need[6]." Continued research with high-tech devices promises to provide occupational therapists with important tools to enable clients to reach their occupational potential.

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Virtual reality and occupational therapy

Lili Liu

Virtual reality (VR) can be defined as the "human-computer interface that allows a user to interact with and become immersed in a computer generated environment[1]". Images can be displayed on a computer monitor, screen or through a head-mounted display which blocks out the real world. In addition to visual images, auditory and proprioceptive senses may also be incorporated to help make the immersion in the simulated environment seem more realistic. The development and applications of VR in the entertainment and computer games industry are well-known but over the past decade, interest in the potential therapeutic uses of virtual reality has increased. For example, VR has been used effectively to treat acrophobia (fear of heights)[2] and fear of flying[3,4]. Virtual reality offers a safe and less expensive way of providing a close-to-realistic experience in the process of desensitising a client. Glantz, Durlach, Barnett and Aviles[5] describe the work of other researchers who have used VR to treat persons with body-image disorders, dyskinesia associated with Parkinson's disease and social phobia. This report describes VR research on the assessment of two areas of function: driving and wayfinding.

Driving

This study began in 1997 when my colleagues and I evaluated the DriVR, a virtual reality simulator system for driving assessment. The technology was developed by Imago Systems in Vancouver for assessing driving skills in persons who have experienced a head injury. The simulator was created to provide a more realistic method of assessing driving skills compared to traditional driving simulators. A description of the hardware and software is provided in Liu, Miyazaki and Watson[6]. The DriVR allowed the driver to travel around 3D worlds, in this case a Dodge caravan. The driver used a steering wheel, a brake and an accelerator. He or she used a head-mounted display to see the road ahead and could see from side to side just by turning his head.

The DriVR simulator provided one practice and 10 testing scenarios, which appeared in a continuous sequence as the participant drove through a small town. The scenarios provided a variety of road characteristics (curved, sloped, traffic merge, lane change, etc.) and incorporated traffic signs, objects (building, lampposts, road markers, parked cars, pedestrians, etc.). As the driver "drove down the road," the computer software tracked the driver's progress. Did the driver cross the middle line? Did the driver react quickly enough to stop signs? Could the driver merge or avoid a car backing out of a driveway?

A total of 148 out of 162 participants completed the DriVR testing (73 men and 75 women) and formed eight age groups ranging from 13 to 76+ years. Fourteen were unable to complete the assessment due to nausea or physical discomfort. In addition to normative data, we were able to demonstrate, using a group of 15 head-injured participants, that the DriVrR was able to discriminate between performance of head-injured and uninjured participants[7]. This study was also unique in that VR was used with the elderly population[8]. For all pass/fail measures, performance had no significant relationship to age group. However, many continuous measures were significantly related to age group. Most of these relationships could be attributed to the tendency of older participants to drive at slower speeds. For example, compared to younger participants aged 13-35 years, adults over 55 years took almost twice as long to complete the test. Although it was feasible to use VR with the elderly, complaints about the head-mounted display and simulator sickness increased significantly with age. However, symptoms reported by the older group were no greater than those reported by the middle-aged group. The DriVR has since undergone further validation by comparing DriVR measures to other indicators of driving ability in adults with brain injury[9].

Figure 1. A participant manipulates the building models over the input board.

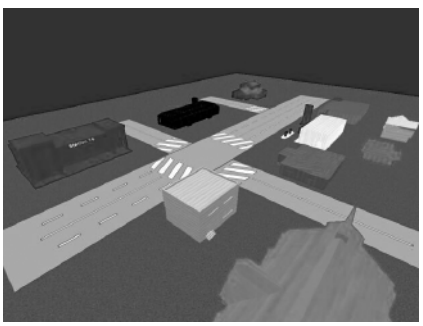

Figure 2. The virtual neighbourhood as set-up is displayed on a screen.

Wayfinding

The second study used VR to examine a component of wayfinding ability called cognitive mapping, defined as a mental representation of a person's environment[10]. Currently, cognitive mapping can be assessed by having a person draw a map or manipulate 3D objects representing elements of an environment. These approaches, however, are difficult to score, and the drawing task may be too abstract for some clients. To address these challenges, we created and used a tangible-user interface (TUI). A TUI is a physical object, such as a steering wheel or foot pedals, used as a computer interface in the virtual domain[11]. In this case, we used 3D model houses that, when placed on a tabletop board, would input real-time data to a computer (Figure 1). The task for the subject was to take a bus tour through a virtual scenario such as the one shown in Figure 2, and to match the scenario using the model houses. As the number of buildings increased steadily from two to eight, so did the level of difficulty.

A total of 20 healthy subjects participated in this study: 10 under 55 years of age and 10 were 55 years or older. Eight measures were taken, one of which we called "similarity," which quantified whether a subject identified the correct building and placed it on the input board in the correct position and orientation. This assessment clearly differentiated the younger age group from the older group, and scores in both groups were correlated with level of difficulty (see Figure 3).

Implications for occupational therapy

Computer graphics are, at best, still virtual and not real. Due to a delay in response time, some users experience "simulator sickness." However, this area of technology is developing rapidly and some computing scientists are interested in the challenge of designing programs with therapeutic and assessment applications. Occupational therapists can use their expertise in function and user requirements to advise the creators of these applications. With further research and development, VR, in combination with TUIs, may enhance occupational assessment and intervention. Currently, VR can be used by design teams to facilitate decisions about accessible and universal design of a built environment. For example, prior to or in place of a mock built environment, a client could view and "experience" physical features of a home in the design phase. Clients can also take virtual tours of potential residential care settings before taking a trip to an actual site.

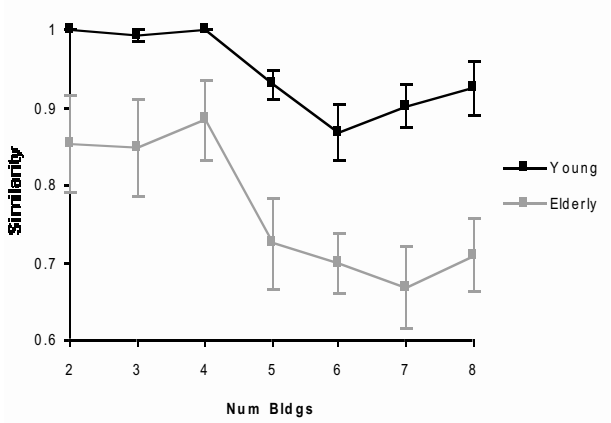

Figure 3.

Similarity scores of the two groups declined with increasing level of difficulty.

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Technology and occupation: High technology vision aids for an aging population

Linda S. Petty

As the members of the baby boom generation become senior citizens, the growing market of aging consumers is providing an incentive to the developers of assistive technology. Similarly, mainstream manufacturers are increasingly aware of the need to provide information appliances and other products in formats that will be more accommodating to variances in mobility, vision, hearing, cognition and manual dexterity[1]. By 2041, the number of seniors will have grown to 10 million, comprising 22.6% of Canada's population[2]. This prevalence is expected to remain, due to a low fertility rate and longer life spans. Indications are that we are in transition toward a society in which seniors will represent a quarter of the population in Western countries[3]. An increase in numbers of individuals with visual impairments is widely predicted, as many eye conditions are age-related. Data on the current age distribution of visually impaired individuals indicates that 38.1% of people became functionally visually impaired after their 64th birthday. Visual impairments that occur among older adults include: macular degeneration, glaucoma, diabetic retinopathy and cataracts[4]. For example, nearly 23% of Canadians between the ages of 43 and 64 and 56% between the ages of 65 and 84 will develop age-related macular degeneration[5]. Many Canadian occupational therapists will find their usual rehabilitation strategies and equipment, or the seniors' environment, will need to be altered to accommodate visual impairments.

The American Occupational Therapy Association promotes the contribution of occupational therapists with clients with low vision, both by sponsoring a self-study course, Low Vision: Occupational Therapy With the Older Adult[6] and through a Consumer Tip Sheet: Maintaining Quality of Life With Low Vision[7]. Canadian occupational therapists are shaping new roles in driving evaluations but have yet to secure a role in the traditional low vision/blindness service delivery model of ophthalmologists for medical intervention, optometrists for spectacles and low-technology low vision aids and Canadian National Institute for the Blind rehabilitation workers for other supports. Occupational therapists, nevertheless, have much to offer, with a client-centred frame of reference and wide background training in physical, psychosocial and developmental needs and issues. As many aging clients have sensory, cognitive or physical restrictions other than vision, occupational therapy assessment skills are well suited to recommending technology to augment or replace the lost visual ability for personal, leisure or productivity needs. This column highlights a range of new options offered by advances in high technology aids for low vision and blindness, which therapists can harness to improve the occupational performance of their clients in the areas of reading and writing. While many seniors may prefer the simplicity of a closed circuit TV, others are avid computer users who want to continue to e-mail or web-browse with screen magnification software support. Still others are willing to make the jump to using a computer with screen reading or optical character recognition/reading software, if adequate training is available.

Reading magazines, financial documents or microwave food packaging can become possible again with a closed circuit television shown here in reverse polarity to provide white text on black background.

Closed circuit televisions

A closed circuit television (CCTV)* is a video magnification system consisting of a video screen interfaced with a video camera. Video magnification is achieved in two ways: (a) The electronic conversion from the small camera image to the larger display screen; and (b) The optical effect of the camera's zoom lens. CCTVs are ideal reading aids for handwritten material, newspapers or magazines and three-dimensional objects such as medication or food labels, as well as magnifying the user's own handwriting for checks or letter writing. CCTVs have been the workhorses of low vision users since their commercialization in the 1970s. However, the real and potential growth in numbers of users has sparked a wave of

*For CCTVs and other technologies highlighted in this article, see the definitions and links to manufactures at the University of Toronto's Adaptive Technology Resource Centre's Technical Glossary at www.utoronto.ca/atrc/reference/tech/techgloss.html

development, with greater portability or automatic focusing of the camera each time a new item is placed on the table, or the magnification level is changed. Lower pricing has also been encouraging with some camera units costing as low as $200 USD, and colour camera units now closer to the black and white camera unit prices.

The growing, competitive market and developments in digital imaging technology will potentially produce a wider range of products and pricing, with more options to retain the camera images. To date, problems with video card compatibility has made integration with notebook computers inconsistent, and equipment is chopped into distance, mid and near magnification functionality. As low vision is having an increasing impact on our workforce, development may focus on smaller camera units that are less obtrusive and fit more readily into the business environment. In the future, improved standards and imaging technology could ensure smooth transition between viewing the presenter's face at a meeting, taking a screen shot of the presentation materials and reviewing a magnified version of the handout. This could all be done without changing lenses, manipulating obtrusive cameras or losing the flow of listening and participating in the event at hand.

Screen magnification

For the computer, an initial method of visual accommodation is to use the operating system options to increase the font size, colour contrast and use the lower resolution display settings. A further option is to increase the display size to 21 inches or larger. The next step is to add screen magnification software, often in conjunction with a larger monitor. Magnification programs run simultaneously and seamlessly with the computer's operating system and applications and offer inverted colours, enhanced pointer viewing and tracking options. The text, dialogue boxes, menus, etc., can also be read out loud by some screen magnification software, which aids fluctuating vision and helps new users to understand what is being displayed and hear what they type[8].

Future development needs to encompass greater flexibility in incremental magnification and improved quality and user control of the range of speech feedback. An integrated voice recognition interface would also greatly enhance the ease of use, in raising and lowering the magnification levels and moving around the screen in response to verbal requests, instead of by memorized keystrokes or by mouse. Automatic loading of user settings would also facilitate customization for common applications and seamless multitasking.

Screen reading

Screen reader software with a software or hardware speech synthesizer is run in conjunction with all computer applications as the stand-alone auditory interface of all computer functions, or as an addition to magnification. Current screen readers will work quite well with the major word processors, spreadsheets, e-mail applications and web browsers. Users of the technology still grapple with complex web sites, numerous pop-up browser windows or any program to manipulate graphics. Proprietary databases, so common in large companies, may require customization of the screen reader, a challenge not always achievable or effective in some environments.

Many users are interested in voice recognition to input text, yet this is very difficult to utilize effectively without visual feedback. Better integration with voice recognition, and a voice interface to operate screen reader commands would improve the simplicity and ease of use, especially for older users who are not familiar with the keyboard. A screen reader that could act on other software applications and provide complete feedback along with voice input would be a seamless way to surf the web, research information, communicate with friends and family and manage finances.

Scanner and optical character recognition/ reading software

With the plunging prices of flatbed scanners, using optical character recognition (OCR) to translate printed material into electronic text has become very popular. Using a scanner, various pieces of small print or pictures, from mail, books, magazines, etc., can be viewed on the computer screen in magnification or read out loud. Rather than manually bringing documents in with mainstream OCR software, many people with visual impairments prefer using OCR software with its own speech feedback and magnification and text tracking features. This costly, specialized reading software can read documents downloaded from the Internet, where libraries of non-copyrighted text files are available for free. Currently, copyrighted materials can only be scanned in by the user, at some expenditure of time, or downloaded for a membership fee by American citizens only from www.bookshare.org, due to copyright laws. This is frustrating for non-Americans, knowing that the 600-page best seller is already scanned and available but not to Canadians. We need stronger Canadian copyright laws, which protect and enhance access for people with disabilities, to enable those who cannot see or turn book pages due to motor problems to

Victor Reader Vibe by Canadian company, Visuaide, is a compact DAISY player with embossed tactile markings which also plays audio and MP3 CDs.

obtain electronic copy instead of hard copy.

Digital playback devices

There is a new format for recording text material digitally to replace the previous books on cassette tape. The DAISY (Digital Accessible Information System) format digital talking books includes "markup" to enable users to use a table of contents, then skip directly to the desired page, enter a specific page number, or return to a previously placed bookmark. The books are stored on CD and can be played using software or on specialized digital playback equipment for talking books. The initial playback machines were bulky, cost $600 and weighed 1.5 kilograms or more; newer versions are half the price and similar to a portable CD player in size and weight.

The future must bring greater portability, lower cost and complete access to the publication market for readers with visual impairments. When subscribing to a magazine or buying a book consumers should be able to choose between an electronic or print format. The electronic format of every publication could be downloaded to an inexpensive, cool, sexy lightweight player, easy to slip in the pocket or clip to a belt and listen to during the commute or at the park, instead of only at a computer or desk.

Areas for growth

One key area for growth in provision of service to people with visual impairments is to improve quantitative measurement of outcomes needed in the area of service, device provision and support. There is a need for objective and in-depth product knowledge to tease out reality from advertising among those who recommend and authorize funding for these products. A clear understanding of features, strengths and limitations of the products and outcomes for the users would promote effectively matching products with individuals' needs, skills and environments. As we move forward in this emerging practice area, documenting the outcome of the intervention offered by occupational therapists, and having adequate and effective knowledge of assistive technology for vision loss should be high priorities in our field.

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Linda Petty, OT Reg (Ont) is a Clinical Specialist with the Adaptive Technology Resource Centre, part of the Resource Centre for Academic Technology at the University of Toronto. She coordinates the Vision Technology Service, a Regional Assessement Centre for High Technology Sight Enhancement and Sight Substitution Aids for the Ontario Ministry of Health. She also teaches three of the six courses offered by Mohawk College towards a certificate in High Technology Vision Aids. For more information contact Linda by e-mail at linda.petty@utoronto.ca or (416) 946-3617. Her mailing ad-dress is Adaptive Technology Resource Centre, RCAT, 130 St. George St., Toronto, ON M5S 3H1.

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Most people never run far enough on their first wind to find out they've got a second. Give your dreams all you've got and you'll be amazed at the energy that comes out of you. —William James, American Philosopher

CAOT Learning Services

Continuing Professional Education

CO-HOSTED WITH CAOT

May 26-28

CAOT 2005 Conference: Celebrating diversity in occupation. Vancouver, BC. Co-hosted with the B.C. Society of Occupational Therapists. Contact: CAOT, Tel: (800) 434-2268, ext. 228; e-mail: conference@caot.ca.

ENDORSED BY CAOT

February 25 – 26

Beyond the Clinic: Managing Chronic Pain and Return to Work. Edmonton, AB.

April 1 – 2

Return to Work: Building Blocks for Success. Winnipeg, MN.
Contact: Carolyn Hay, The Positive Approach, P.O. Box 32, Fonthill, ON, L0S 1E0. Tel: (905) 892-8845; Fax: (905) 892-8845; e-mail: cmhay@iaw.com.

April 13 – 17

Specialized Techniques for Measuring Sensory Integration – Course 2. Saskatoon, SK. Contact: Judy Bodnarchuk, Events of Distinction, 104 – 2002 Quebec Avenue, Saskatoon, SK S7K 1W4. Tel: 306-651-3118; Fax: 306-651-3119; e-mail: eofd@sasktel.net.

September - April (Distance Learning)

1. Modern Management, 2. Continuous Quality Improvement for Health Services or 3. Risk Management and Safety in Health Services. Contact: Cheryl Teeter, Canadian Healthcare Association, 17 York St., Ottawa, ON K1N 9J6. Tel: (613) 241-8005, ext. 228; www.cha.ca.

ONGOING

Myofascial Release Seminars:
Myofascial Release I, Myofascial Release II, Fascial-Pelvis Myofascial Release, Cervical-Thoracic Myofascial Release, Myofascial Unwinding, Myofascial Mobilization, Paediatric Myofascial Release. Various Canadian and U.S. dates. Instructor: John F. Barnes, PT. Contact: Sandra C. Levengood, Myofascial Release Seminars, 222 West Lancaster Avenue, Paoli, PA 19301. Tel: (800) FASCIAL (327-2425); Fax: (610) 644-1662; e-mail: paoli@myofascialrelease.com; www.myofascialrelease.com.

WEB-BASED DISTANCE ED

Acquire an Expertise in Driving: Evaluation, Adaptation & Retraining. Bilingual Program. January-April; May-August; September-December. Provider: School of Physical and Occupational Therapy at McGill University. Contact: Isabelle Gélinas, PhD, 3654, Promenade Sir-William-Osler, Montreal, QC H3G 1Y5. Tel: (514) 398-4514; Fax (514) 398-6205; e-mail: isabelle.gelinas@mcgill.ca; www.autoeduc.ca.

NIDMAR COURSES 2005

Effective Disability Management Programs (Module A). Dates: on-line Jan. 10-16; March 28 - April 3.

Legislation and Disability Management (Module I). Dates: on-line Feb. 14-27; May 9-22.

Workers' Compensation and Return to Work (Workshop Module J). Dates: on-line Feb. 28 - March 6.

Insurance and other benefits (Module L). Dates: on-line Jan. 17-23; April 18-24.

Disability Management in Unionized Organizations (Module N). Dates: on-line Jan. 31 - Feb. 6; May 9-15.

Disability Management from a Human Resources Perspective (Module P). Dates: on-line Feb. 14-20; June 13-19.

Marketing and Education in Disability Management and Return to Work (Module U). Dates: on-line Feb. 7-13; April 18-24.

Information Management (Module V). Dates: on-line Feb. 28-March 6; May 2-8.

Job Analysis (Module E). Dates: March 15-20.

Provider: National Institute of Disability Management and Research (NIDMAR). Contact: Heather Persons, NIDMAR, 830 Shamrock Street, Suite 202, Victoria, BC V8X 2V1. Tel: (604) 736-2578; Fax: (604) 733-2519; e-mail: Heather.Persons@nidmar.ca; www.nidmar.ca.

Graduate Certificate Program in Rehabilitation Sciences (University of British Columbia and McMaster University). Five required courses offered Jan.-April & Sept.-Dec. each year include: Evaluating Sources of Evidence (RHSC 501), Reasoning and Clinical Decision Making (RHSC 503), Measurement in Practice (RHSC 505), Developing Effective Rehabilitation Programs, (RHSC 507) and Facilitating Learning in Rehabilitation Contexts (RHSC 509). For instructors, deadlines, program and course details please visit http://rhsc.det.ubc.ca.

Graduate Program in Post-Secondary Studies (Health Professional Education). Memorial University of Newfoundland. Centre for Collaborative Health Professional Education and Faculty of Education. Tel: (709) 737-3402; Fax: (709) 737- 4379; e-mail: edugrad@mun.ca; www.mun.ca/sgs/.

DALHOUSIE SERIES

January - April

Advanced Research Theory and Methods for Occupational Therapists (OCCU 5030). Instructor: Dr. Brenda Beagan

Community Development for Occupational Therapists (OCCU 5042).
Instructor: Dr. Loretta do Rozario

Contact: Pauline Fitzgerald, Graduate Secretary, School of Occupational Therapy, Dalhousie University, Forrest Bldg., Room 215, Halifax, NS B3H 3J5. Tel: (902) 494-6351; Fax: (902) 494-1229; e-mail: p.fitzgerald@dal.ca.

L'art de la supervision clinique. Series of web-based workshops or in-person, two-day workshops (in French only). Provider: Consortium national de formation en santé and the University of Ottawa. Contact: Michèle Clermont, Consortium national de formation en santé. Tel: (877) 221-CNFS (2637); www.cnfs.ca.

January 13	Bâtir un climat de confiance
February 10	Maîtriser la rétroaction
March 17	Évaluer le rendement
April 21	Explorer les divers modèles de supervision
May 26	Apprendre à gérer les problèmes

For information on how to register a CAOT endorsed course, call 1 (800) 434-2268, ext. 231 or e-mail: education@caot.ca

LA FONDATION CANADIENNE D'ERGOTHÉRAPIE

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CANADIAN OCCUPATIONAL THERAPY FOUNDATION

To fund scholarship and research

News from the Foundation

Upcoming competitions

COTF has revised its awards' program. Please visit our web site for more informtaion.

February 28

Critical Literature Reviews	(3 x $5,000)
COTF Research Grant	(1 x $5,000)
Isobel Robinson Historical Research Grant	(1 x $1,000)
Roulston Innovation Award (academic institutions to indicate interest to COTF)	

March 1

OSOT Presentation Award	(1 x $1,000)
OSOT Multi-Disciplinary Presentation Award	(1 x $1,000)

March 31

Marita Dyrbye Mental Health Award	(1 x $500)

April 1

AAROT Research Award
AAROT Research Education Award
AAROT Research Presentation Award

For details and application forms, see the Grants section at www.cotfcanada.org.

New awards

• **The Isobel Robinson Historical Research Grant** was first launched in 2004. This grant is ideal for those whose interest lies in history.

• **The Critical Literature Reviews** are being launched for the first time in 2005. Applicants have the opportunity to review current literature based on topics that are of relevance to the occupational therapy field.

Art auction "Art Ability"

Art Ability took place October 16, 2004 at the Art Institute of Toronto. COTF raised approximately $1,000 in this first-time fundraising event! Thank you to the Art Institute of Toronto for use of the space at no cost and to those who attended.

Your support counts!

COTF sincerely thanks the following individuals, companies and organizations for their generous financial support during the period of September 1 to October 31, 2004. We will acknowledge donations received after November 1, 2004 in a future issue.

Sue Baptiste
Gillian Barr
Giovanna Boniface
Jane Bowman
Sandra Bressler
Karen Brunsch
Donna Campbell
Canadian Association of Occupational Therapists
Patricia Card
Anne Carswell
Mary Clark Green
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Jacquie Ripat
Annette Rivard
Patricia Rodgers
Cathy Sinclair (in kind)
Kimberley Smolenaars
Debra Stewart
Thelma Sumsion
Francois Theriault (in kind)
Barry Trentham
Irvine Weekes
Muriel Westmorland
Seanne Wilkins
Gabriele Wright
1 anonymous donor

Notes from the CAOT Delegate to the World Federation of Occupational Therapy

Anne Carswell

The interim meeting of the WFOT was held in Cape Town, South Africa in May 2004. Over 50 member countries attended and conducted a considerable amount of work during the six-day meeting. Three more countries were admitted into full membership of the WFOT (Mexico, Russia and Slovenia) and two more were admitted as associate members (Panama and Iran). This makes a total of 60 member countries and six associate member countries.

A position paper on community based rehabilitation was approved by the delegates. A further one on human rights is in development.

Visit www.wfot.org to read about a small change in the organization structure of the management team.

Fees were restructured to enable some financial viability in the WFOT. The organization will develop a premium pricing mode for approval during the 2006 meeting. Individual membership was strongly endorsed as one means to increase needed revenues. These revenues are to support delegates from developing countries to attend the WFOT meetings and to enable the development of occupational therapy programs and professional organizations in these countries.

Some of the key achievements in 2002-2004 include:

- approval of educational guidelines for the Minimum Standards for the Education of Occupational Therapists – 2002;
- translations of these into French, Spanish and German;
- publication of the Bulletin; a universal definition of occupational therapy;
- development of several International Advisory Groups (IAG); and
- refinement of the Occupational Therapy International Outreach Group (OTIOG).

The plan for the coming two years will include:

- development of clear procedures for educational programs;
- improvement of data collection regarding approved schools;
- support of worldwide occupational therapy research;
- increasing the membership; development of a marketing plan for the WFOT;
- assistance for countries who wish to be members of WFOT;
- piloting of the IAGs, determination of entry-level competencies; and
- support of evidence-based occupational therapy practice.

WFOT Congress – Occupational Therapy in Action: Local and Global
July 23-28, 2006
Sydney Australia.

View www.wfot.org for more information
Start saving your money now. It will be a superb opportunity to network with colleagues from around the world.

New Internet resource on assessing power-mobility driving

This new web site provides information and resources to occupational therapists and power mobility drivers about two assessments: the Power-mobility Indoor Driving Assessment (PIDA) and the Power-mobility Community Driving Assessment (PCDA). Many occupational therapists involved in seating and mobility identify a need to determine if clients can safely drive their power wheelchairs or scooters. They need to work with clients to decide if more training, device or environmental modifications are needed. Sometimes they need to assess if it is appropriate to prescribe power mobility.

Both the PCDA and the PIDA were designed to meet the needs of occupational therapists and drivers. Reliability and validity testing have been conducted for both instruments, through funding from the Canadian Occupational Therapy Foundation. Through the web site, the PCDA instructions and rating form can be downloaded as PDFs. The PIDA scoring sheet can be downloaded, as can an order form to purchase the assessment manual.

We hope that making the instruments accessible through the Internet will support their use by occupational therapists and power mobility drivers, with the goal of optimizing safe and independent use of power mobility. Just go to: www.fhs. mcmaster.ca/powermobility/

— Lori Letts, PhD, OT Reg (Ont)

CAOT · ACE

November board meeting highlights

An orientation session was held at National Office in Ottawa on November 24, 2004 for new Board Directors Kim Larouche (Newfoundland and Labrador), Sandra Sims (New Brunswick) and Heather Young (Nova Scotia). The new members met later in the day with other CAOT Board Directors and the Canadian Occupational Therapy Foundation (COTF) Board of Governors for an education session on the topic of governance responsibilities. This presentation was provided by consultant Monique Dansereau who also worked with the CAOT Board of Directors and CAOT senior staff the following day to review the CAOT strategic plan. The new strategic plan will be finalized by the Board in May 2005 for implementation in the 2005-2006 fiscal year.

The CAOT Board meeting was held on November 25 and 26. Outcomes of the meeting include:

- A plan for the review of CAOT award policies and procedures for May 2005;
- Approval of recommendations of the Editorial Board regarding several initiatives to reduce publication waiting times in the *Canadian Journal of Occupational Therapy*;
- Request for the development of a report on roles and responsibilities relating to the work of CAOT for the World Federation of Occupational Therapists for May 2005;
- Support for recommendations of the Certification Exam Committee to investigate methods to reduce the length of the certification examination;
- Approval of a pilot project to review use of plain language in the certification exam;
- Review of a draft donation and partnership agreement with COTF. These documents will be presented for final approval in May 2005, after approval of the 2005-2006 CAOT operating budget;
- Review of the report of the Policy Audit Committee and approval of the revised policies relating to:
  - Global board-staff linkage,
  - Monitoring executive director performance,
  - Absence of executive director,
  - Documentation for annual general meetings, and
  - General finance policy;
- Withdrawal of Agreement on International Trade and Health Promotion position statements as these are out of date;
- Review of discussion papers on the topics of occupational therapy and mental health care, occupational therapy and end-of-life care, and occupational therapy and driver rehab. These will be used to develop position statements to be published early this year;
- Review of reports from professional issue forums on occupational therapy and mental health care, and occupational therapy and end-of-life care, held at the 2004 CAOT Conference. These reports will be posted on the CAOT web site;
- Approval of a revised position statement on quality teleoccupational therapy; and
- Review of a report of the indicator project of the Academic Credentialing Council (ACC). Support of ACC recommendations that the indicator-based process and scoring be pilot tested in parallel with the existing accreditation system over the next three years.

Budget and finances

A report was presented on the positive financial outcome from the 2004-2005 fiscal year and operating budget surplus generated as a result of the success of the 2004 Conference and one-time operating budget savings in the National Office. As a result of these savings, the Board was able to approve project proposals relating to the development of a pan-Canadian political advocacy strategy as well as funding to update the *Profile of Occupational Therapy Practice in Canada* for 2005 and to cover costs associated with professional issue forums on clinical practice guidelines and ethical decision-making at the 2005 CAOT Conference. Funding for the development of a web portal on evidence-based practice was also approved. The Board approved early completion of the seven-year plan at the end of this fiscal year to meet the savings target of $1 million in net assets as recommended by our auditors. A report on the first draft of the 2005-2006 operating budget was received. The Board recommended that no fee increase be made in the 2005-2006 membership dues.

—Lauren Klump, CAOT Communications Coordinator

CONTACT YOUR CAOT BOARD DIRECTOR
Please visit www.caot.ca and click on contacts.
Your provincial/territorial director welcomes your questions and feedback.