

Mrs. Porter's Story: Using Evidence To Inform Clinical Decisions

■ Katherine M. Post, PhD, OTR/L, Joan E. Simmons, PhD, OTR/L, and Jessica Scheer, PhD

Gina has been working in a skilled nursing facility since she completed her occupational therapy training 3 years ago. Although she has not worked with Mrs. Porter previously, Gina has been impressed with her active presence in the home. Not only is Mrs. Porter busy with her own projects, but also she enthusiastically invites passers-by to come into the activity room and find a project for themselves.

Mrs. Porter is a 76-year-old woman who contracted polio as a young child and used forearm crutches to ambulate until she started showing signs of the late effects of polio, which in her case were pain and weakness in the legs, shoulders, and upper back. She began using a power wheelchair in her mid-60s, and when she could no longer transfer herself for dressing, bathing and toileting at 72, she moved to the nursing facility.

Mrs. Porter had recently experienced increased muscle weakness and pain in her shoulders, increased discomfort from pressure on her right ischial tuberosity, and significant discomfort in her hips and lower back. She sat on a slab foam cushion that was at least 4 years old, and she had trouble repositioning herself in her chair. As a result, her sitting endurance decreased to 2 hours at a time. Although Mrs. Porter still attended bingo games, moving her chips with a rubber-tipped pointer, and made needlepoint pillows for the facility's annual bazaar, she no longer was able to deliver the residents' mail or attend community trips. She was becoming discouraged and asking to spend more time in bed.

Gina wanted to help Mrs. Porter to be able to spend more time in her power wheelchair and regain her role as ambassador for the activity room. She knew from her reading that muscle and joint pain, muscle weakness and atrophy, and fatigue are common among people who had polio (Kalpakjian, Toussaint, Klipp, & Forchheimer, 2005; Kling, Persson, & Gardulf, 2000) and that pressure sores are uncommon among these individuals because they have sensation as long as they can shift weight appropriately (Halstead, 2006; Halstead & Silver, 2000). Gina decided to review the evidence from the scientific literature for information about a wheelchair seating system that would allow Mrs. Porter to sit more comfortably and be able to reposition herself to avoid the risk of pressure sores. She found two articles that seemed particularly relevant to Mrs. Porter's situation.

Finding Solutions

Individually Fitted Wheelchair Systems

Trefler, Fitzgerald, Hobson, Bursick, and Joseph (2004) conducted a pilot study to assess the outcomes of a wheelchair system intervention with 34 manual wheelchair users 60 years of age or older who resided in one of three long-term-care facilities in the Pittsburgh, PA, metropolitan area. Participants used wheelchairs because of fear of falling; frailty; or pathology, such as arthritis or paralysis, sitting for 6 hours or more each

day. None of the participants had decubitus ulcers, dementia, or Alzheimer's disease. The purpose of the study was to evaluate the effectiveness of an individualized wheelchair system on a person's independent mobility, functional reach and posture, quality of life, and satisfaction with assistive technology. For this study, the term *wheelchair system* refers to the manual wheelchair itself and the seating system (cushion, back component, seat belt, and other positioning components).

Using a semicrossover design, Trefler et al. (2004) randomized participants into one of two groups. After the baseline testing of both groups for mobility and reach, Group A received a seating assessment. Three months after Group A's new wheelchair systems were introduced, both groups were tested again, and Group B received seating assessments. At the final visit 3 months later, both groups were tested a third time. The study noted that "differences between the original wheelchair system and an individually fitted wheelchair system were seen statistically and clinically" (p. 25) for both groups in all areas measured. Participants in both groups became significantly more satisfied with their individually fitted wheelchair systems, being able to move around in their new wheelchairs at a faster rate. Group A's postural stability continued to improve between 3 and 6 months postintervention possibly because of increased muscle strength and flexibility in the trunk and arms. Added postural stability seemed to increase participants' confidence to reach forward. Social functioning increased significantly over 3 months postintervention for both groups, but a trend was observed that it decreased at 6 months for Group B, though no reason was cited. The study was limited by small sample size and high dropout rate because of either death or loss to follow-up.

Trefler et al.'s (2004) clinical observations were (a) positive attitudinal changes from "I don't know. . . a wheelchair is a wheelchair" to "can we change this or that?" (p. 26); (b) decreased fear of falling out of the wheelchair; (c) increased comfort, postural stability, and ability to reach with upper extremities; and (d) overall increased ease of wheelchair mobility within and outside the long-term-care facility.

Pressure-Reducing Seat Cushions for Wheelchair Users

Geyer, Brienza, Karg, Trefler, and Kelsey (2001) conducted a pilot study to compare the effectiveness of using pressure-reducing seat cushions with polyurethane foam slab cushions over a 12-month period to decrease the incidence of pressure ulcers among 32 residents of two skilled nursing facilities (one suburban, one urban academic medical center) in the Pittsburgh, PA, metropolitan area. The goals of the study were to compare the incidence rate of seating-acquired pressure ulcers between the two study groups, to compare data about seating interface pressure with pressure ulcer incidence, and to develop and test a protocol for a multicenter clinical trial to investigate how well pressure-reducing seat cushions prevent pressure ulcers among elderly nursing home residents.

Participants were 65 years of age or older, used their wheelchairs for more than 6 hours each day, and did not have any sitting surface

pressure ulcers at the start of the study (Geyer et al., 2001). Thirty-two participants were randomly assigned to one of two groups. Group A (treatment group) received pressure-reducing seat cushions selected from a group of commercially available contoured cushions “designed to improve tissue tolerance in sitting” (p. 124), such as a Jay cushion. Group B (control group) received 3-inch convoluted foam or egg-crate cushions, typical of the inexpensive cushions often used in nursing homes. Participants in both groups received seating assessments, including interface pressure measurements recorded while sitting on their seat cushions, using a force sensing array pressure-mapping device. All participants received weekly skin checks and risk assessments.

Geyer et al. (2001) found no significant difference between the two groups for the incidence of pressure ulcers or for initial peak interface pressure. However, significant differences were found between the groups for length of time sitting: although all participants were expected to sit each day for a cumulative total of at least 6 hours, Group B more frequently did not meet the required minimum of seated time than Group A. Additionally, a significant difference existed between the groups in terms of the location of pressure ulcers, with no ulcers occurring under the ischia in Group A. Finally, pressure ulcers developed in 10 of the 17 participants in Group B (59%) and in 6 of the 15 in Group A (40%). The authors reported that a lack of statistically significant difference was due to the small sample size of the study. Finally, comparison of those residents who developed pressure ulcers over the course of the study with those who did not, regardless of intervention, revealed a significant difference in initial peak interface pressure.

Implementing Solutions

Based on the results of these studies, Gina could reasonably predict that Mrs. Porter would benefit from individually fitted seating modifications to her power wheelchair. She was confident that the place to start would be to recommend a pressure-relieving seat cushion to reduce the discomfort Mrs. Porter felt on her right ischial tuberosity. Gina worked with the local wheelchair vendor who regularly serviced Mrs. Porter's wheelchair to allow Mrs. Porter to try three commercially available pressure-relieving cushions. Mrs. Porter tried each cushion for 2 or 3 days before choosing the one that was the most comfortable and that allowed her to lean from side to side to shift her weight and reposition herself most easily.

The next step was to select a back support system that would increase Mrs. Porter's postural stability and reduce the discomfort in her hips and lower back. Working with the vendor, Gina and Mrs. Porter tried several contoured foam back cushions that provided some lateral stability and lumbar support but still allowed her to shift her weight and reach forward and to the sides. Because of Mrs. Porter's increased shoulder and upper-back pain and weakness from years of ambulating with forearm crutches, she and Gina worked on weight-shifting strategies that she could do independently without

aggravating her pain. These strategies included leaning forward and to each side and performing hip extensions. Gina also adjusted the height of the wheelchair armrests and footrests to enhance these movements and to accommodate the new cushion. She then encouraged Mrs. Porter to attend a biweekly wheelchair exercise class offered at the facility that incorporated stretching, gentle isometric exercises, and muscle relaxation activities. Gina also suggested that Mrs. Porter incorporate muscle stretching and relaxation activities into her daily routine.

After the new cushions arrived, Gina and Mrs. Porter worked together to develop a schedule that included building up the amount of time in her wheelchair during activities that were important to her, with some time out of the chair to rest once or twice a day. By planning ahead, Mrs. Porter could make sure that her rest times did not interfere with her participation in the craft or bingo activities she enjoyed.

Follow-Up

Over the next 4 weeks, Mrs. Porter was able to increase her seating tolerance from 2 hours with her old foam cushion to 4 to 5 hours with her new seating system, and she began going on short community outings again and resumed delivering mail a few times each week, a niche she had created for herself and had dearly missed. Gina continued to check in with Mrs. Porter weekly to monitor her sitting tolerance, level of comfort and fatigue, satisfaction with her wheelchair, participation in the wheelchair exercise class, and level of participation in valued activities. They discussed how Mrs. Porter might handle other physical changes as she aged, and Gina told her about an interdisciplinary seating clinic where she might be seen for evaluation and delivery of more complex assistive technology, such as a power wheelchair that tilted or reclined. These services would require the involvement of persons with more specialized knowledge and experience with equipment than Gina had, but Gina would accompany Mrs. Porter to the clinic to help ask and then understand the answers to her questions. Mrs. Porter said that she would keep that option in mind, but for now, she was very satisfied with her new seating system and how it allowed her to return to participating in the activities she enjoyed. Gina was pleased with the change in Mrs. Porter's level of participation within the nursing facility as well as Mrs. Porter's sense of accomplishment and satisfaction. She also realized the professional satisfaction of being an evidence-informed practitioner who focuses on providing client-centered and occupation-based interventions. ■

References

- Geyer, M. J., Brienza, D. M., Karg, P., Trefler, E., & Kelsey, S. (2001). A randomized control trial to evaluate pressure-reducing seat cushions for elderly wheelchair users. *Advances in Skin and Wound Care*, 14(3), 120–129.
- Halstead, L. S. (Ed.). (2006). *Managing post-polio: A guide to living and aging well with post-polio syndrome*. Washington, DC: NRH Press.
- Halstead, L. S., & Silver, J. (2000). Nonparalytic polio and postpolio syndrome. *American Journal of Physical Medicine and Rehabilitation*, 79, 13–18.
- Kalpakjian, C. Z., Toussaint, L. L., Klipp, D. D., & Forchheimer, M. B. (2005). Development and factor analysis of an index of post-polio sequelae. *Disability and Rehabilitation*, 27, 1225–1233.
- Kling, C., Persson, A., & Gardulf, A. (2000). The health-related quality of life of patients suffering from the late effects of polio (post-polio). *Journal of Advanced Nursing*, 32(1), 164–173.
- Trefler, E., Fitzgerald, S. G., Hobson, D. A., Bursick, T., & Joseph, R. (2004). Outcomes of wheelchair systems intervention with residents of long-term care facilities. *Assistive Technology*, 16(1), 18–27.
- Katherine M. Post**, PhD, OTR/L, FAOTA, is Associate Professor and Chair, Occupational Therapy Department, Springfield College, 263 Alden Street, Springfield, Massachusetts 01109; kpost@spfldcol.edu.
- Joan E. Simmons**, PhD, OTR/L, is Associate Professor, Occupational Therapy Department, Springfield College; jsimmons@spfldcol.edu.
- Jessica Scheer**, PhD, is Research Professor, School of Public Health and Health Services, George Washington University, Washington, DC; hcsjxs@gwu.edu. She also is one of the American Occupational Therapy Association's Consultants for the Evidence-Based Practice Project.

Post, K. M., Simmons, J. E., & Scheer, J. (2008, June). Mrs. Porter's story: Using evidence to inform clinical decisions. *Technology Special Interest Section Quarterly*, 18(2), 1–2.

Technology

Special Interest Section
Quarterly
(ISSN 1093-7137)

Published quarterly by The American Occupational Therapy Association, Inc., 4720 Montgomery Lane, Bethesda, MD 20814-3425; ajot@ota.org (e-mail). Periodicals postage paid at Bethesda, MD. POSTMASTER: Send address changes to *Technology Special Interest Section Quarterly*, AOTA, PO Box 31220, Bethesda, MD 20824-1220. Copyright © 2008 by The American Occupational Therapy Association, Inc. Annual membership dues are \$225 for OTs, \$131 for OTAs, \$75 for Student-Plus members, and \$53 for Standard Student members. All *SIS Quarterly* are available to members at www.ota.org. The opinions and positions stated by the contributors are those of the authors and not necessarily those of the editor or AOTA. Sponsorship is accepted on the basis of conformity with AOTA standards. Acceptance of sponsorship does not imply endorsement, official attitude, or position of the editor or AOTA.

Chairperson: Kimberly Hartmann
Editor: Katherine Post
Production Editor: Jennifer Hart

Resources for Evidence-Based Practice in Assistive Technology

■ Katherine M. Post, PhD, OTR/L,
and Christopher Bigelow, MLS

In this issue of the *Technology Special Interest Section Quarterly*, an article titled “Mrs. Porter’s Story” (Post, Simmons, & Scheer, 2008) offers an example of how one occupational therapist used evidence to guide and support day-to-day practice decisions, which now is considered an essential component of best practice across a wide variety of professions. Evidence-based practice in occupational therapy requires that practitioners know where to find evidence and understand how to interpret and use it. The American Occupational Therapy Association (AOTA) has posted a number of resources for evidence-based practice on its Web site (www.aota.org/Educate/Research.aspx). These resources include links to databases of occupational therapy-related literature, tutorials on searching and understanding literature, and Web sites devoted to evidence about health outcomes.

The Web sites listed in this article will help readers to access evidence to guide the use of assistive technology in clinical practice. Also provided are some resources for professionals who wish to measure outcomes and contribute to the small body of evidence currently available on assistive technology.

Finding Evidence: Systematic Reviews

When they apply to the topic of interest, systematic reviews are an efficient source of evidence. Also known as evidence syntheses, systematic reviews use specific strategies to search for, assemble, critically appraise, and synthesize all the studies that address a specific clinical question. Several useful Web sites with systematic reviews are available either for free or by subscription. Even those that require subscriptions, though, are available to researchers and professionals through local university or hospital libraries and public library systems, which often allow the public to use their resources in person, although not remotely. Check with your local library to see where you might be able to access some of these subscription resources. If you cannot gain access, most of these resources have a free version that allows searching of abstracts and citations.

- The Cochrane Collection (www.cochrane.org) is one of the leading sources of systematic reviews and has stored its massive database of reviews in the subscription Cochrane Library (<http://thecochranelibrary.com>) and the subscription Cochrane Collection. Unfortunately, Cochrane currently has very little specific information about assistive technology or assistive devices.
- OTseeker (www.otseeker.com) is probably the most useful of the resources. It is a free online database of occupational therapy-related systematic reviews developed by occupational therapists in Australia and backed by Australian universities and occupational therapy associations. A search on the term *assistive devices* is particularly successful.
- PEDro (www.pedro.fhs.usyd.edu.au/), or the Physiotherapy Evidence Database, is another free Australian systematic reviews resource but with more of a physical therapy focus.
- Both the free PubMed (www.pubmed.com) and its subscription version MEDLINE contain citations for systematic reviews. Depending on how you access this massive database, different ways exist to limit your search to systematic reviews. For example, in PubMed, choose “reviews” as a type of publication in the “limit” section. The information contained within MEDLINE overlaps significantly with Cochrane.

When relevant systematic reviews are not available, search for individual articles and evaluate the level, quality, and relevance of the study for your clinical question yourself. Researching assistive technology can lead you to a wide variety of databases, many of which are geared toward specific populations or practice settings. Again, many of these databases require subscriptions, so check with your local libraries to see how you might gain access. In cases where both free and subscription versions of a resource exist, the free version typically does not contain full text and has a minimal search interface, whereas the subscription version provides more full text and/or better search functionality.

- The medical subject heading (MeSH) term *self-help devices* is used in PubMed/MEDLINE to refer to assistive technology and is a good starting place for finding articles. Checking the MeSH index to find the right terms for specific devices, such as wheelchairs, cushions, or communication devices, can ensure a more thorough search.
- ERIC (www.eric.ed.gov), or the Educational Resources Information Center, is a free, government-sponsored database that also has several subscription flavors. Although its main focus is education and teaching, ERIC also contains articles and other documents related to all aspects of education and the lives of students and children, making it an important resource for occupational therapists who focus on that age group or work in a school setting. ERIC includes much information about assistive technology and educational technology.
- PsycINFO (<http://psycinfo.apa.org>), a subscription database produced by the American Psychological Association, contains many relevant articles for occupational therapy and includes a strong collection of articles on assistive technology and rehabilitation. Most college and university libraries that support a psychology program have a subscription to PsycINFO. You can search a smaller, free collection of citations from PsycINFO at <http://psycinfo.apa.org/psycarticles/direct>.
- CINAHL (www.cinahl.com) is an online index to allied health and nursing literature, including occupational therapy journals. Many institutions with allied health or nursing programs subscribe to CINAHL, and it contains many citations to articles about assistive technology.
- OT Search (www1.aota.org/otsearch) is the subscription database provided by AOTA and the American Occupational Therapy Foundation that covers the literature of occupational therapy and related subject areas. A less comprehensive, free version called OT 101 is available at www.aotf.org/database/ot101/ot101.htm

Measuring Outcomes in Assistive Technology

These Web sites focus exclusively on the measurement of outcomes in assistive technology. Most are the product of federally funded university-based programs, whereas others are provided by consumer-based organizations.

- The ATOMS project (www.r2d2.uwm.edu/atoms/) at the University of Wisconsin-Milwaukee provides an annotated list of assistive technology outcomes Web sites and a primer in assistive technology outcomes, and lists books, selected articles, special issues of journals, and Web sites devoted to assistive technology outcomes resources and research.
- CATOR (www.atoutcomes.com/), or the Consortium on Assistive Technology Outcomes Research, is based at Duke University with partners at universities across the United States and Canada.
- The Adaptive Technology Resource Centre at the University of Toronto (http://atrc.utoronto.ca/index.php?option=com_content&task=view&id=175&Itemid=69) has an annotated list of links to technology outcome tools.

- The Family Center on Technology and Disability (www.fctd.info/webboard/displayResources.php?id=101) is supported by the U.S. Department of Education's Office of Special Education Programs.
- The Center for Outcomes Research and Education at the University of Illinois at Chicago (www.uic.edu/ahs/OT/CORE/assistive.htm) includes specific resources on technology outcomes.

Web Sites Devoted to Specific Measurement Tools

- Psychosocial Impact of Assistive Devices Scale: www.piads.ca/112/index.html
- The Matching Person and Technology assessment process and instruments: <http://members.aol.com/IMPT97/MPT.html>
- Quality Indicators for Assistive Technology Services: http://natri.uky.edu/assoc_projects/qiat ■

Reference

Post, K. M., Simmons, J. E., & Scheer, J. (2008, June). Mrs. Porter's story: Using evidence to inform clinical decisions. *Technology Special Interest Section Quarterly*, 18(2), 1-2.

Katherine M. Post, PhD, OTR/L, is Associate Professor and OT Department Chair at Springfield College, 263 Alden Street, Springfield, Massachusetts 01109; kpost@spfldcol.edu.

Christopher Bigelow, MLS, is a Reference Librarian at Babson Library, Springfield College; cbigelow@spfldcol.edu.

Post, K. M., & Bigelow, C. (2008, June). Resources for evidence-based practice in assistive technology. *Technology Special Interest Section Quarterly*, 18(2), 3-4.

NEW BOOK ON ETHICS FROM AOTA!



Reference Guide to the Occupational Therapy Ethics Standards 2008

Edited by Deborah Yarett Slater, MS, OT/L, FAOTA

AOTA Press is proud to announce the 2008 edition of **Reference Guide to the Occupational Therapy Ethics Standards!** This must-read text will assist all occupational therapy personnel as they confront ethical issues due to the complexity of society and the systems in which they work. Content includes a broad variety of educational tools, including new advisory opinions and articles that address current ethical trends. Readers will be challenged to rethink some of the situations encountered in the past as a result of increased awareness about ethical issues.

Order #1139E

Member Price: \$34.00

Nonmember Price: \$48.25



BK-702

To order, call toll-free **877-404-AOTA**
or order online at **www.AOTA.org**

PERIODICALS
POSTAGE
PAID AT
BETHESDA
MD

The American Occupational
Therapy Association, Inc.
PO Box 31220
Bethesda, MD 20824-1220

