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Finding and Using Evidence To Inform Practice for Persons With Work-Related Hand Injuries

■ Debbie Amini, MEd, OTR/L, CHT, Marian Arbesman, PhD, OTR/L, and Deborah Lieberman, MHSA, OTR/L, FAOTA

Kelly arrived early at the outpatient rehabilitation center where she worked as an occupational therapist with persons with work-related injuries and clinical conditions. The previous day, she attended a continuing education workshop on evidence-based practice, so she wanted some time to review new referrals and fit them into her busy clinical schedule. Kelly noticed an order for a client with thumb carpometacarpal (CMC) joint osteoarthritis secondary to a work-related intra-articular fracture, a condition similar to those she has treated many times in her career. Because she had a few minutes until clients would start arriving, Kelly decided to begin implementing the information she had learned at the workshop.

Reviewing the Evidence

Kelly began reading the workshop handouts and paused at a figure delineating the three components of evidence-based practice. According to the handout, evidence-based practice was based on a combination of clinical expertise and reasoning, client preferences, and scientific evidence. During her 5-year tenure as an occupational therapist, Kelly had accumulated a wealth of knowledge and experience about the approaches and treatment methods that are consistently effective with clients similar to the one in the referral. As part of her clinical expertise and client-centered practice, she routinely initiated an occupational profile with new clients, which is a summary of the client's occupational history and experiences, patterns of daily living, interests, values, and needs (American Occupational Therapy Association [AOTA], 2008b). Kelly also made it a priority to establish treatment goals and potential intervention approaches that would appeal to the client and reflect his or her preferences as indicated through client-centered assessments, such as the Canadian Occupation Performance Measure (COPM; Law et al., 1998) and the Disabilities of Arm, Shoulder, and Hand Assessment (DASH; Institute for Work and Health, 1997).

Kelly noted the third component of evidence-based practice, the scientific evidence for methods and interventions. She was eager to integrate this level of evidence into her intervention choices because she had heard that third-party payer sources are more frequently asking, before payment, for empirical evidence that supports treatment interventions. Although she believed that her skills in this component might be the most limited of the three, she remembered the workshop presenter mentioning that many sources of evidence that fit within the scope of occupational therapy practice have been evaluated and summarized. The presenter had discussed the resources available on the AOTA Web site, and Kelly decided to begin her search there.

Within the "Practitioners" section of the AOTA Web site, Kelly selected "Evidence-Based Practice and Research," and found a variety of resources, including the Evidence-Based Practice Resource Directory, and Critically Appraised Topics (CATs) and Critically Appraised Papers. CATs are "at-a-glance" summaries of systematic reviews of a focused question, and Kelly found a heading pertaining to occupational therapy and clinical conditions related to workers' compensation, which included CATs summarizing findings from reviews on low back; hand, wrist, and forearm; elbow; and shoulder (AOTA, 2008a). She read the summary of the systematic review that answers the focused question, "What occupational therapy interventions are effective in the rehabilitation of persons with work-related conditions or illnesses of the forearm, wrist, and hand?"

The clinical scenario provided a broad perspective of the importance of the question for occupational therapy practice, and Kelly noted that the Summary of Key Findings section critically appraised and interpreted the main findings of the review. The findings were grouped by intervention categories: silicone gel sheets, splinting, thermal modalities, ultrasound, low-level laser therapy, massage, early mobilization, exercise, gloves, pain control techniques, workplace interventions, function-based activity interventions, and miscellaneous treatments. The summary pointed to articles that discussed osteoarthritis, which provided evidence on splinting, heat wraps, and exercise. In particular, the summary of the evidence on splinting indicated that splinting is effective for osteoarthritis, but no evidence exists on one specific splint type being the most effective, or on specific wearing schedules. The list of studies in this section included one by Egan and Brosseau (2007) that Kelly downloaded for further review.

The CAT discussed the results of several Level I studies, which are randomized controlled trials (RCTs), systematic reviews, and meta-analyses: studies designed to provide the highest level of evidence for an intervention. Michlovitz, Hun, Erasala, Hengehold, and Weingand (2004) indicated that continuous low-level heat wraps are an effective superficial physical agent modality to reduce pain and improve functional status in osteoarthritis. A systematic review by Brosseau, MacLeay, Robinson, Tugwell, and Wells (2003) indicated no difference between high- and low-intensity exercise, and although both groups in their study improved on functional status, the low-intensity group had a clinically important benefit for pain versus the control group, whereas the high-intensity group did not. In addition to the studies directly related to osteoarthritis, the

CAT discussed an RCT of persons with chronic and acute hand injuries that could be applied to Kelly's client. Guzelkucuk, Duman, Taskaynatan, and Dincer (2007) found that participants who were given tasks that simulated activities of daily living (ADL) function (e.g., opening doors, using a spoon, opening jars) showed significantly greater improvement in the assessed outcomes than those participating in exercise-based treatment alone. In addition, a systematic review by Williams, Westmorland, Schmuck, and MacDermid (2004) examined the evidence for the effectiveness of workplace-based interventions in decreasing pain and increasing functional status. Their review was not limited to studies of hand, wrist, and forearm clinical conditions, and the results indicated that the evidence is insufficient to identify effective workplace interventions that result in less pain and improved functional status. Finally, Verhagen et al.'s (2006) systematic review on conservative methods for musculoskeletal treatment reported that limited evidence exists for ergonomic keyboards.

After reviewing the CAT, Kelly turned to the Egan and Brosseau (2007) article she downloaded from the online version of the *American Journal of Occupational Therapy*. Seven studies were included in the review, examining the effectiveness of splints for persons with osteoarthritis. Although the article found that all splint designs were effective for this condition, the overall evidence was rated as limited or fair because the review included no high-quality studies.

The information from the CAT and Egan and Brosseau (2007) confirmed Kelly's belief in a client-centered approach to splint design and selection. Because all of the devices studied performed equally well with enhancing function and decreasing pain, Kelly was able to leave the selection of the specific splint to the client, who could base the decision on comfort and performance.

Implications for Practice

The next step for Kelly was to design an intervention plan based on the findings from the client evaluation, infused with intervention choices validated through her evidence review. She reviewed the history and demographic information about her client, Mrs. Williams, that was recorded during the initial evaluation. The initial injury was an intra-articular trapezial fracture that resulted from a workplace fall. Her hand was placed in a cast for 8 weeks; no therapy was provided after cast removal, and she immediately returned to full-duty work. Since the time of the injury, Mrs. Williams reported increasing levels of pain and difficulty completing work and other daily occupations. Based on the results of the COPM and DASH, she was experiencing difficulties with work-related tasks, instrumental activities of daily living (IADL; opening jars, vacuuming), and the self-care task of dressing. She has been diagnosed with CMC arthritis secondary to the trapezial fracture. This information, and Kelly's clinical experience and expertise, would inform several treatment choices as well as frequency and duration of therapy as part of the intervention plan. Kelly wrote treatment goals that specifically addressed these functional problems and developed a list of interventions and time frames.

Splinting

Splinting the thumb is considered the first line of defense when treating osteoarthritis of the CMC joint. Immobilizing the CMC during functional activities will assist with decreasing pain and acute inflammation, as well as enhance functional abilities in all areas of occupation. Several styles of CMC splints are commonly used; some are available premade, and many can be custom made by the occupational therapy practitioner. Some splints incorporate only the CMC joint, leaving the wrist and other thumb joints free; other styles incorporate the wrist, CMC, and metacarpophalangeal (MP) joints. Still other designs immobilize the CMC and MP yet leave the wrist and interphalangeal joints free. Kelly and Mrs. Williams decided on the mini thumb spica, which immobilizes the CMC and MP and extends just past the wrist crease on the radial side of the hand. According to the client, this splint provided adequate immobilization of the painful joint yet allowed enough freedom of movement for all functional activities at work and home.

Ice and Heat

Although evidence to support the use of ice for pain and inflammation was limited in the evidence review, Kelly had had clinical success with clients using ice during acute inflammation to reduce swelling and improve pain levels. She recommended that Mrs. Williams use ice after any activities that stress the thumb, before retiring for the day, and anytime its use is warranted by pain or swelling. Kelly asked Mrs. Williams to keep a daily record of ice usage and effect in order to assist her with determining its effectiveness.

When the pain and inflammation subsided, Kelly recommended heat to enhance extensibility of the joint and surrounding structures before engaging in occupations. Evidence suggests that continuous low-level heat wrap therapy is effective for reducing pain and leading to improved functional outcomes. Kelly recommended that Mrs. Williams apply small hand warmers held in place with a self-securing bandage to the affected area of her CMC joint. Based on her clinical experience with multiple heat modalities, Kelly also suggested that she try the dip method with a home paraffin unit upon rising and throughout the day as needed. As with the ice treatments, Mrs. Williams was asked to keep a record of heat usage to assist Kelly with problem-solving future treatment plans.

Workplace Interventions and Modifications

A traditional occupational therapy approach to treating painful hand osteoarthritis is to provide adaptations and modifications to the environment that enable function, prevent deformity, and decrease pain associated with specific activities. Mrs. Williams works as an electronics assembler, a job that requires repetitive use of handheld tools, such as crimpers and wire cutters. Kelly recommended that Mrs. Williams begin to use tools that will reduce the stress to the CMC joint, such as stationary, power-assisted tools activated with foot switches. Recommendations such as these must be submitted formally to Mrs. Williams's employer and include a rationale for why the purchase would benefit both the employee and the employer.

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Computer use also is part of Mrs. Williams's job tasks because component completion must be entered into a computer database. Although evidence for the effectiveness of workplace adaptations was insufficient, limited evidence suggests that adapted keyboards can enhance upper-extremity function. Kelly suggested a roller ball mouse to reduce the force required of the thumb while holding the mouse, moving the cursor, and clicking. She also suggested a mouse rest that provides support for the wrist during data entry.

With input from Mrs. Williams, Kelly suggested methods and devices that could be used during ADL and IADL activities. For example, hands-free jar openers and the consistent use of scissors for opening packages can greatly reduce thumb pain experienced in the kitchen.

Functional Activities and Exercise

When the acute phase of inflammation and pain brought on by excessive physical stress on the CMC joint subsided, attention could turn to enhancing strength and motion. Functional activities, as Kelly discovered in the CAT, have been found to be effective when used as part of an overall treatment plan to improve function of the hand. Low-intensity exercise also was found to enhance function and decrease pain. These two approaches can be combined to provide an activity regimen that will create stronger intrinsic and extrinsic hand musculature and more flexibility within the CMC joint without increasing discomfort or deformity. Mrs. Williams was instructed to complete household activities, such as emptying and loading the dishwasher and placing dishes in the cabinet, using both hands to grasp and handle heavier items. The repetitive, yet low-resistance movement of the entire hand and arm meet the criteria of a low-impact aerobic functional activity.

Education

Kelly did not find empirical evidence to support client education in her evidence review. However, based on her observations and clinical experience, she believes that providing clients with education and resources empowers and helps them to achieve long-term improvements. More specifically, practitioners and clients can review handouts together and discuss the signs, symptoms, and implications for CMC osteoarthritis. Clients must learn to self-manage this chronic condition in order to minimize the potential for an acute episode and further deformity.

Conclusion

Kelly was pleased with her experience using an evidence-based approach to practice. Her initial concerns that finding evidence would be time consuming and result in having to abandon her favorite interventions to adopt new approaches proved unfounded. Kelly is now confident that she can continue to use her clinical expertise while exploring new methods based on evidence from the literature. Locating and using systematic reviews and other evidence-based practice resources from the AOTA Web site saves time by providing the depth of information needed to support practice without being overwhelming and difficult to understand. Kelly now appreciates that using evidence is a win–win–win: for herself, her clients, and third-party payers. ■

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Work & Industry in the News

■ Deborah Lieberman, MSHA, OTR/L, FAOTA, and V. Judith Thomas, MGA

A strategic goal of the American Occupational Therapy Association (AOTA) is to engage proactively with key external organizations and decision-makers to assert occupational therapy leadership in essential areas of societal need. This news item highlights the Association's collaboration with the American College of Occupational and Environmental Medicine (ACOEM), which requested that AOTA staff and members review and comment on updated chapters of the *Occupational Medicine Practice Guidelines* (ACOEM, 2008) for work-related disorders. The revision of the ACOEM's guidelines was a 3-year rolling process, with updates occurring chapter by chapter.

AOTA staff and members reviewed the first chapter on elbow complaints. Among the reviewers were Paula Bohr, PhD, OTR/L, the review author for AOTA's evidence-based literature review on occupational therapy interventions in the rehabilitation of persons with work-related injuries or clinical conditions of the elbow, and Marian Arbesman, PhD, OTR/L, a consultant to the evidence-based practice (EBP) project.

AOTA EBP and Reimbursement and Regulatory Policy staff commented on the chronic pain chapter. Member reviewers included Doris J. Shriver, OTR, FAOTA, QRC, CLCP, owner of OT Resources, Inc. in Denver, Colorado, and Dr. Arbesman. For the chapter on low back disorders, comments and recommendations were accepted from Jeff Snodgrass, PhD, MPH, OTR/L, CWCE, and

Dr. Arbesman. Dr. Snodgrass is the review author for AOTA's evidence-based literature review on occupational therapy interventions in rehabilitation of persons with work related injuries and clinical conditions of the low back and a co-author of the *Occupational Therapy Practice Guidelines for Individuals With Work-Related Injuries and Illnesses* (Kaskutas & Snodgrass, in press).

Of significance are ACOEM's additions of *occupational therapy* as distinct from *physical therapy* throughout the guidelines, and the statement that occupational therapists are trained to recognize both psychological and physical issues that may influence the treatment of back pain (ACOEM, 2008). Also as a result of AOTA's comments, ACOEM included a greater emphasis on activity-based, cognitive behavioral, and occupational approaches, in addition to references to ADL and environmental challenges. ■

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