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## CASE REPORT

# Occupation-Centered Practice in Hand Rehabilitation Using the Experience Sampling Method

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Implementing occupation-centered approaches in hand rehabilitation has been uncommon because this specialty has been dominated by biomedical approaches. However, some trends suggest that the practice of occupational therapy in hand rehabilitation is changing. Third-party payers are increasingly interested in final outcomes rather than in incremental increases in range of motion that do not represent functional progress (Foto, 1997). In addition, there is a trend toward treating more cumulative trauma cases and fewer acute injury cases (Wolfe, 1997). Acute injuries require specialized knowledge of the microcomponents of hand function to yield successful functional outcomes. In contrast, successful treatment of cumulative trauma injuries requires knowledge of psychosocial, contextual, and subjective factors in addition to knowledge of microcomponents (Blackmore & Hotchkiss, 1996; Johnson, 1993). As occupational therapists are expected to treat more clients with cumulative trauma injuries, there will be a growing need to monitor these factors because they will influence outcomes.

Despite this need, contextual and psychosocial factors are often missing from assessments used by occupational therapists (Dunn, Brown, & McGuigan, 1994; Foto, 1997). To address this problem, Park, Fisher, and Vellozo (1994) have recommended that performance be assessed in the environment in which the client will be functioning, a view that is certainly consistent with the movement towards home health and community-based therapy (Baum & Law, 1997). However, occupational therapists specializing in hand rehabilitation are often unable to observe clients in their home and other community environments and need a method that captures physical, contextual, and psychosocial aspects of the rehabilitation process as they occur in the client's actual, lived environment.

The experience sampling method (ESM) of data collection has the potential to enhance occupation-centered practice in hand rehabilitation by capturing the physical, contextual, and psychosocial aspects of functional return. This method is currently used by mental health clinicians and occupational therapy researchers (deVries, 1992; Hedricks, in press; Hedricks & Budetti, in press; Jacobs, 1994). The ESM, whose reliability and validity have been well-documented (Csikszentmihalyi & Larson, 1987), requires that clients carry an electronic signaling device (electronic pager, wrist terminal, or palm-top computer) and a booklet of identical questionnaires called Experience Sampling Forms (ESFs) with them as they go about their everyday lives. Clients are typically signalled at semi-random intervals throughout the day, at which time they

are required to momentarily stop what they are doing and complete an ESF, which takes approximately 1 minute. The ESF typically contains questions pertaining to the client's occupation, physical and social contexts, and subjective experiences at the time of the signalling (deVries, 1992).

This paper reports the use of the ESM with an outpatient with one type of cumulative trauma, cubital tunnel syndrome. This condition affects the ulnar nerve at the elbow and is the second most common nerve entrapment syndrome in the upper extremity (Rayan, 1992). The ESM was used for 1 week to (a) assess treatment follow-through into the client's actual, lived environment; (b) guide and individualize treatment; and (c) achieve functional outcomes with occupation-centered approaches.

### Case Description

The client was a 40-year-old, right-hand-dominant woman who began experiencing pain in her right shoulder and elbow while working as a supermarket florist. Three years after the initial complaint, she underwent arthroscopic surgery for her right shoulder, and a year later, a right elbow medial epicondylectomy. Ten days after the second surgery, she began outpatient rehabilitation with an occupational therapist specializing in hand rehabilitation and was seen for a total of 27 weeks.

### Assessments

The client's progress was measured using four indicators: physical measures (Blackmore & Hotchkiss, 1996), activities of daily living (ADL), client's awareness of her nonadaptive substitution patterns, and the therapist's impressions of treatment follow-through. Physical measures were obtained in the hand clinic (see Table 1). Performance of valued ADL was determined by the client's self-reports and the therapist's observation of the client's positioning and movement patterns in the clinic (see Figure 1). Movement patterns were categorized into two main types: functional patterns, in which the client attempted to use the affected upper extremity, and nonadaptive substitution patterns (see Figure 1). Nonadaptive substitution patterns result in movements that are limited and uncontrolled rather than adaptive and selective (Woodson, 1995). *Client awareness* of nonadaptive substitution patterns *in the clinic* was measured by the percentage of therapist's verbal cuing during each treatment session. This percentage was calculated by dividing the number of times the client required a verbal cue by the total number of times the client used her upper extremities. Client awareness outside the clinic was derived from the client's daily self-reports, ESFs, and daily summaries, and a semistructured interview after the 1 week of ESM paging. Therapist's impressions included the first author's reflections and

weekly discussions by the coauthors.

### Baseline Initial Evaluation

At baseline evaluation, physical measures (shown in Table 1) were representative of a person 10 days after medial epicondylectomy with muscle reattachment (Blackmore & Hotchkiss, 1996). ADL performance also was typical of a person recovering from recent hand surgery. The client was able to perform various ADL (donning shirt, grooming, bathing, laundry, and driving a vehicle) using one-handed techniques. She was also able to delegate difficult ADL, such as cleaning the house and doing yard work, to her family. Because the client's surgery had been recent, the therapist reasoned that the occupational therapy techniques that had proved successful for similar conditions would be sufficient to return this client to her previous level of functioning within 10 weeks.

### Evaluation at 10 Weeks After Occupational Therapy

The client achieved most of her physical goals including increased active range of motion and decreased hypersensitivity. However, she continued to report significant functional limitations in performing her daily occupations of dressing, grooming, handwriting, and driving. She also required a high frequency of verbal cues to avoid nonadaptive substitution patterns during clinic appointments.

Functional return did not occur as expected, and both the client and the therapist expressed frustration with her lack of functional progress. The client's nonadaptive substitution patterns were particularly puzzling because she reported incorporating her right (affected) upper extremity into daily occupations performed in her actual, lived environment.

In addition, the client demonstrated an inability to generalize efficient movement patterns from one functional task to another. For example, while in the clinic, she demonstrated her ability to open a filing cabinet with her right (affected) hand using good body mechanics. Seconds later, she quickly returned to a nonadaptive substitution pattern by using her left hand both to hold the items and to open the drawer. Her right hand also quickly returned to a nonadaptive substitution pattern (shoulder elevated, scapula protracted, elbow flexed, thumb adducted).

Because the client seemed unable or unwilling to become aware of her nonadaptive substitution pattern, it became clear that an additional approach would be needed to address this problem. Also, the lack of functional return suggested that treatment needed to be more individualized for the client to return to her valued daily occupations. Thus, the ESM protocol was implemented during Week 17 to assess hand use and frequency of substitution

**Table 1**  
**Physical Measure Results at Baseline 10 Weeks, and Discharge (27 Weeks)**

Measure	Baseline initial evaluation (10 days postsurgery)	At 10 weeks (after Standard Hand Rehabilitation protocol <sup>a</sup> )	At 27 weeks (after Standard Hand Rehabilitation Protocol with ESM)
Active range of motion (pain-free) elbow flexion-extension	-15°-115°	-15°-135°	-10°-145° (functional range)
<b>Sensory</b>			
Size and type of protection at incision site <sup>b</sup>	8 cm x 8 cm gel pad 1/4" thick	3 cm x 4 cm gel pad 1/8" thick	2 cm x 4 cm foam pad 1/8" thick
Frequency of wearing pad <sup>c</sup>	Worn at all times	Intermittent	Intermittent
Hand Dowel Test <sup>b</sup>	Not tested secondary to postsurgical contraindications	Tolerated 3 out of 10 textures	Tolerated 7 out of 10 textures
Grip strength (in pounds) (right/left)	Not tested secondary to postsurgical contraindications	Right-25 Left-65	Right-46 Left-62.5
Quality of movement patterns during functional activities (right upper extremity only)	Not tested secondary to postsurgical contraindications	Robotlike (1 joint moves at a time)	Fluid, coordinated (joints move simultaneously)

Note. ESM = experience sampling method.

<sup>a</sup> See Blackmore & Horchkiss (1996).

<sup>b</sup> Test based on Downey Hand Center Hand Sensitivity Test (Barber, 1990).

<sup>c</sup> Worn as needed during functional tasks involving excessive tactile input near or on elbow incision site.

patterns in the client's actual, lived environments.

### *ESM Protocol and Result*

The ESF was modified specifically for this client to record hand use (right, left, both, or neither) and the position of the right (affected) hand while performing daily occupations. Also included in the booklet of identical ESFs were daily summaries designed to capture the client's daily occupations that may have been missed by the ESM paging schedule. These were based on the *Uniform Terminology for Occupational Therapy—Third Edition* (American Occupational Therapy Association, 1994).

After the week of ESM, the client returned the booklet of ESFs to the therapist, stating, "I now realize how much I use my left hand." She also stated that she was surprised at how little she used her affected arm during ADL. After hearing her comments indicating an enhanced awareness of her nonadaptive substitution patterns, the therapist realized that the client did not intentionally use these movement patterns. Instead, these patterns appeared to have evolved during the 4 years from the onset of her pain, through the multiple surgeries and rehabilitation, to the present.

### **Implementation of Occupation-Centered Treatment**

The information collected on six out of seven daily summaries completed by the client during the week of ESM paging indicated that she wanted to, but did not, perform one of her valued daily occupations, sewing. When asked why not, the client responded, "I can't." In response, the therapist invited her to run the clinic's industrial sewing machine, which she subsequently learned how to use. As a result, the therapist initiated a more occupation-centered approach by inviting the client to begin sewing when she





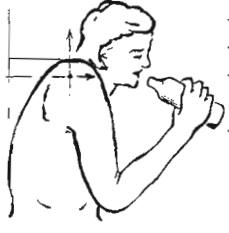

came into the clinic.

In order to translate this occupation-centered approach into the client's actual lived environment, the therapist then asked the client where her home sewing machine was. She responded, "It's in the cabinet, and I haven't used it in years." As a part of her treatment, this client was asked to use her home sewing machine. Within a week, she reported mending her son's pants. Then the client was asked to complete a number of home sewing projects that she had left unfinished since her surgeries. A week later, she brought a finished project, a sports bag for her daughter, into the clinic. In retrospect, it was interesting to note how providing for her children, an occupation she valued, was accomplished by another personally meaningful occupation, sewing.

The therapist then asked the client to sew three heavy bean bags that would be used as weights during her lifting activities in the clinic. Activities with these weights helped simulate the cleaning activities she valued yet had difficulty performing at home. After completing this project, the client recognized a need for additional heavy bean bags that would make the four-legged swing set in the pediatric treatment room more secure and therefore safer for children seen in the clinic. She voluntarily completed these projects on her own time after she was discharged from hand rehabilitation. Thus, for this client, the ESM was key to enhancing her awareness of her actual hand use and the frequency with which she used nonadaptive substitution patterns and to guiding and individualizing treatment.

### *Evaluation at Discharge/27 Weeks*

By discharge, all physical measures had improved significantly, particularly grip strength (see Table 1). In addition, during ADL performed in the clinic, the client required

ADL	At initial evaluation and at 10 weeks of hand rehabilitation	At discharge (27 weeks) of hand rehabilitation incorporating Experience Sampling Method
Verbal cuing required to correct substitution patterns	Maximum (75-100% of the time)	Minimum (0-25% of the time)
Dressing (donning sleeved shirt)	 <ul style="list-style-type: none"> <li>- <u>shoulder</u> adducted and internally rotated</li> <li>- <u>elbow</u> flexion (120°)</li> <li>- <u>forearm</u> pronated</li> <li>- <u>thumb</u> tucked into palm</li> </ul>	 <ul style="list-style-type: none"> <li>- <u>scapula</u> neutral</li> <li>- <u>shoulder</u> neutral</li> <li>- <u>elbow</u> minus 10° extension</li> <li>- <u>forearm</u> neutral</li> <li>- <u>thumb</u> neutral</li> </ul>
Handwriting (e.g., filling out Experience Sampling Form; writing a personal check)	 <ul style="list-style-type: none"> <li>Forearm and elbow <b>NOT</b> resting on surface.</li> <li>- <u>scapula</u> elevated/protracted</li> <li>- <u>shoulder</u> abducted</li> <li>- <u>elbow</u> flexion (90°)</li> <li>- <u>wrist</u> neutral</li> </ul>	 <ul style="list-style-type: none"> <li>Forearm and elbow resting on surface</li> <li>- <u>scapula</u> neutral</li> <li>- <u>shoulder</u> abducted (15°)</li> <li>- <u>elbow</u> flexion (70-90°)</li> <li>- <u>wrist</u> slight extension</li> </ul>
Drinking from water bottle	 <ul style="list-style-type: none"> <li>- <u>neck</u> protruding</li> <li>- <u>back</u> kyphotic (rounded)</li> <li>- <u>scapula</u> elevated and protracted</li> <li>- <u>shoulder</u> adducted and internally rotated</li> </ul>	 <ul style="list-style-type: none"> <li>- <u>neck</u> ear over shoulder</li> <li>- <u>back</u> upright</li> <li>- <u>scapula</u> upwardly rotating</li> <li>- <u>shoulder</u> flexion (60°)</li> </ul>

**Figure 1.** Nonadaptive and functional positioning during activities of daily living (ADL).

minimal to no verbal cues to avoid nonadaptive substitution patterns (see Figure 1). She had also begun initiating use of her right upper extremity, replacing nonadaptive substitution patterns with more efficient, coordinated movements and making postural corrections during functional tasks.

## Discussion

Not only did implementation of the ESM with this client result in the positive outcomes noted above, it also changed the clinical thinking of the client's therapist. Use of the ESM allowed the therapist to recognize nonmovement, poor quality of movement, and odd positioning as indicators of a chronic, nonadaptive substitution pattern. It also permitted the therapist to recognize that the client was not aware of her nonadaptive patterns. In addition, use of the ESM seemed to have increased the client's awareness of her nonadaptive patterns and led to her taking greater ownership of her own rehabilitation.

Supplementing occupational therapy with the ESM proved cost-effective. The cost of the pager rental, service to send the signal to the pager, and assembly of the ESM booklet was approximately the same as two units of service (30 minutes) at this facility. The time involved in this

first effort to supplement therapy with the ESM and to analyze and interpret the ESM data was intensive, however. With more experience, this aspect of using the ESM would likely become more efficient.

### *Considerations for Occupation-Centered Practice*

Before the use of the ESM, the process of engaging the client in her daily occupation was not straightforward. For example, when the therapist asked the client if she wanted to incorporate sewing into her therapy, she declined. However, when reviewing the completed booklet of ESFs, it was obvious to both the therapist and the client that a preferred occupation, sewing, was missing from the client's everyday life. Armed with this knowledge, the goal of the therapist (to engage the client) and the goal of the client (to get better) seemed to merge; the therapy sessions became more collaborative. Use of the ESM facilitated this collaboration by guiding and individualizing treatment for a more occupation-centered practice.

Given the current influence of reimbursement-driven practice, implementing an occupation-centered practice may be difficult. There may be *fewer* opportunities to (a) determine how clients are currently performing their valued daily occupations in their actual, lived environments;



(b) discover daily occupations that are tied to a client's self-identity; (c) determine contextual factors that affect performance of valued daily occupations; (d) modify daily occupations so that the client is able to participate successfully; (e) give clients on-the-spot feedback as they are performing their daily occupations in their home and communities; and (f) complete all of the above within existing therapy sessions at minimal cost. This report describes how these barriers to effective treatment were addressed by using the ESM protocol, which led to functional return when used by this therapist with this client. Further clinical applications with different therapists and client populations will clarify how applicable the ESM is to the occupational therapy profession. ▲

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