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## Functional Hand Skills Throughout the Lifespan

### What should childhood intervention address?

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Posted on: April 10, 2009

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Vol. 25 • Issue 8 • Page 40

It is not often that an OT practitioner is able to follow a patient for more than 30 years. In 1997, I wrote an article in *ADVANCE* about a child named Patrick who, over a period of 18 years (age 3 to 21), had taught me what hand skills young children need to learn for future occupational performance (Erhardt, July 7, 1997).

To read "Early Hand Development", on Patrick's hand function development, click [here](#).

Now, 12 years later, the subject has reached age 34. He offers what I believe is an invaluable retrospective case study. When I reviewed all his evaluations and progress notes, I realized that *Framework II* (AOTA, 2008) could help me organize that information in a way that illustrates its usefulness to pediatric clinicians.

I first evaluated Patrick when he was 3 years old. His parents told me that when he was diagnosed with severe cerebral palsy (athetoid quadriplegia with spasticity), they received a very negative prognosis. They were advised to institutionalize him.

Instead, they made sure he received intensive and ongoing OT, PT and speech services, despite their many moves around the country. The family-centered approach began in childhood with a home-based program of supervised weekly sessions that focused on arm and hand function within the occupational roles of activities of daily living, work/productive activities and play/leisure activities.

As Patrick matured, these activities broadened within expanded school and community environmental contexts. Then my role changed to that of consultant to the school system as well as the family. After four years, the family moved away, but the consultant role continued for the next 27 years.

I was fortunate to gain valuable perspectives about the relevance of their changing goals and the efficacy of the interventions, and shared what I learned with my other families and team members.

At the time of the 1997 article, Patrick was a high-school graduate, almost fully independent in self-care, and enjoyed a variety of leisure activities. He was hired by a rehabilitation agency for computer data entry. Today he works in the family businesses, maintaining their farm by caring for the animals, operating farm vehicles and helping his uncle in the salvage business. This article will illustrate the use of therapeutic purposeful activities as part of regular life routines in the context of occupational roles spanning a period of more than 30 years.

#### Evaluation of Hand Function

At 3, Patrick's evaluation revealed that some of his difficulties with hand skills were related to insufficient head control and shoulder stability, which affected his ability to sit securely without support. Without proximal stability, distal mobility was compromised. Compensatory patterns of shoulder elevation and retraction, as well as associated movements (overflow), interfered with achievement of symmetry and selective, graded midrange control of arm, wrist, hand and finger movements. Bilateral symmetry and finger dissociation necessary for pincer grasp are two examples of important components of early hand development Patrick was missing. His hand patterns interfered with daily life activities such as playing cards.

#### Evaluation Instrument

One of my primary evaluation tools was the Erhardt Developmental Prehension Assessment (EDPA), which

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measures both involuntary and voluntary components of hand function, such as approach, grasp, manipulation and release in supine, prone and sitting.

The theory of inappropriate prehension patterns described in my book, *Developmental Hand Dysfunction* (Erhardt, 1994), compares normal, delayed and atypical hand patterns. It provides a method of analysis based on the assumption that many atypical patterns are compensations for inadequate postural stability due to important missing developmental components. Therefore, intervention is designed to provide those components to, and teach appropriate points of stability for, efficient mobility of arms, hands and fingers.

**Intervention and Outcomes**

Patrick's intervention program was based on developmental theory combined with realistic functional needs. We examined normal developmental sequences and analyzed them for missing components to target for intervention. Our concerns about future adult independence, however, helped keep us on track to introduce and adapt functional activities very early in his therapy program.

**Summary**

Occupational activities reflecting an individual's goals, values and beliefs can be integrated throughout the lifespan into environmental contexts of home, school and community. The subject was always an active, voluntary participant in activities that were directed toward his own goals. The meaning of each activity was unique, influenced by his age, life experiences, roles, interests and situational contexts within family and community, and used therapeutically to facilitate his ability to function in daily occupations.

First, his interests and current occupational roles were considered. Then, each selected activity was analyzed to identify skills needed to perform task components in specific contexts. The therapists' challenge was to synthesize this information, so that activities could be adapted, graded and modified according to his dynamic responses. Successful performance was accomplished by changing the process (sequence, duration or procedures), materials and tools (size, shape, weight or texture), positioning (patient, therapist, adaptive equipment) and other environmental factors.

The ultimate goal was to empower this young man and his family to learn appropriate strategies for enhancing quality of life by ensuring that meaningful occupation was always the central focus of the therapeutic partnership. His dignity was always respected as he guided his own process of adaptation, benefited from the organizing and integrating effects of occupation, and realized his potential capabilities through mastery of tasks he and his family considered important.

**References available at [www.advancweb.com\OT](http://www.advancweb.com\OT) or upon request.**

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