Roles and Functions of Occupational Therapy in Hand Rehabilitation

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Jeanne L. Melvin, MSEd, OTR, FAOTA

Introduction
Since 1970, the role of occupational therapy personnel in the management of upper extremity injury, disease, and disability has progressed until the majority of independent hand therapy centers or hospital-based hand therapy programs are directed or supervised by occupational therapists. This paper describes briefly the current role of occupational therapy in hand rehabilitation. The terms “hand rehabilitation” and “hand therapy” encompass both rehabilitation of the hand and associated involvement of the upper extremity.

This roles and functions paper reflects the recommended practice in this area but is not binding. Occupational therapy personnel need to be informed about organization codes and policies; federal, state and local laws; and professional licenses and regulations. Any of these codes or regulations may negate or revise the content in this paper.

Historical Perspective
The role of occupational therapy in the treatment of upper extremity disability has increased greatly since World War II. This growth coincided with the development of rehabilitation and hand surgery as specialized services. The polio epidemics of the 1950s resulted in increased government support for rehabilitation and gave impetus to the development of assessment of upper extremity function and dynamic splinting. This increased knowledge expanded the participation of occupational therapy in the restoration of upper extremity function. The introduction of moldable plastics during the 1960s revolutionized orthotics and the manufacturing of therapeutic aids, creating new treatment options and increasing the demand for occupational therapy services.

Rapid advances in hand surgery techniques, including the advent of joint replacement surgery and microsurgery, along with advances in tendon surgery, have expanded the practice, research, and knowledge base of hand anatomy and function. The important effect of comprehensive hand therapy to the outcome of surgery for hand trauma, disease, and congenital deformities became evident. As the need for specialists in surgical hand therapy became apparent, occupational therapy personnel filled this role by virtue of their long-standing experience in the treatment of hand dysfunction produced by stroke, head injury, arthritis, polio, trauma, burns, amputations, neurological diseases, and congenital malformation. Occupational therapy hand rehabilitation currently encompasses conservative management of hand impairment associated with disease and deformity, as well as surgical hand rehabilitation.

Three other events testify to the rapid growth of hand therapy and hand surgery as a specialty practice in the 1970s. First, the American Society of Hand Therapists was founded in 1977 to promote education, research, and standards of care in (surgical) hand rehabilitation. The majority of charter members in this association are occupational therapists. Second, in 1976, the American Journal of Hand Surgery was established as a major international journal in response to the expansion of hand surgery as a surgical specialty. Third, national conferences on hand rehabilitation were established by several organizations using occupational therapists as faculty. These are now conducted annually for surgeons and therapists.

Since World War II, occupational therapy personnel have made a major contribution to research, education, and treatment in upper extremity rehabilitation and have authored or contributed to the majority of articles, chapters, and books published on this topic (1).

Philosophical Base
Occupational therapy is based on the belief that purposeful activity (occupation, including its interpersonal and environmental components) may be used to prevent dysfunction, restore functional ability, and facilitate maximal adaptation to impairment (2). The philosophical base of occupational therapy is consistent with the total concept of care necessary to help an individual with hand dysfunction resume a
meaningful, productive role in society. The emphasis of occupational therapy on function, work, purposeful activity, and adaptation is critical to the success and livelihood of an individual trying to overcome the limitations of a severe hand injury or impairment.

**Occupational Therapy Education and Qualifications**

The occupational therapy education process includes course work and/or supervised clinical experience in the following areas: (a) anatomy, physiology, kinesiology, human development, and behavior; (b) neurological, medical, and psychiatric pathology, along with medical and surgical intervention; (c) task and function analyses; (d) methods and modalities for control of edema, pain, inflammation, and spasticity; (e) exercise physiology for increasing range of motion, strength, and endurance; (f) orthotic design and fabrication; (g) prosthetic evaluation and training; (h) sensory re-education; (i) dominance retraining; (j) use of assistive equipment and adaptive methods; (k) environmental adaptation; and (l) the psychological aspects of physical dysfunction and interventions.

Occupational therapy personnel who graduate from an accredited or approved curriculum and pass the AOTA certification examination are qualified to treat hand dysfunction associated with stroke, head injury, neurological and rheumatologic disorders, peripheral nerve injuries, trauma, and congenital disorders.

Therapists working with complex traumatic hand injuries and surgical reconstruction or specializing in surgical hand rehabilitation should have advanced education and/or clinical expertise (through professional education or clinical training) in the following areas: (a) anatomy and physiology; (b) medical diagnosis and symptomatology; (c) surgical indications, procedures, precautions, and outcomes; (d) wound healing and tissue physiology; (e) specific pre-operative and post-operative protocols for surgical procedures; (f) physiology of sensation and neurologic recovery; (g) post-trauma or post-operative orthotic selection, design, and fabrication; and (h) functional analysis related to use of equipment and task performance in the work environment (ergonomics).

This advanced knowledge and skill is vital in planning treatment for complex hand injuries. Therapists need exceptional understanding of upper extremity anatomy and physiology to analyze structural impairment, plan treatment, and have the necessary skills to help the patient progress safely from the critical first weeks post-injury or post-surgery through the entire course of treatment.

**Screening and Referral**

Screening determines if a referral to occupational therapy is indicated. The occupational therapist screens the patient by interview, observation, testing, and chart review.

Patients are considered appropriate candidates for occupational therapy if they have difficulty managing physical daily living skills and social, vocational, or recreational activities specifically due to hand impairment. Referral is also indicated when overall hand function could be improved through occupational therapy intervention.

Any member of the health care team may refer a patient for occupational therapy assessment within the limits of existing regulations. This may include self-referral. State licensure laws, accrediting agency standards, reimbursement regulations, and policies of individual facilities may require a physician referral for assessment and/or treatment.

**Assessment**

The occupational therapy assessment process includes evaluation and re-evaluation. It encompasses determining the type, amount, and duration of treatment.

The initial evaluation consists of interview, observation, and testing to gather the necessary data to determine the therapeutic goals, treatment plan, and the patient's rehabilitation potential. The benefits, cost, and extent of therapy needed are also determined. Whenever possible, standardized tests and objective data are used to document the patient's status. The evaluation typically includes medical history and referral history (age, diagnosis, reason for referral, prior and current treatment, symptoms); personal history (occupation, education, family situation, leisure interests); functional ability and disability (pain, edema, range of motion, strength, gross and fine coordination, dexterity, muscle strength and tone, sensation, wound healing, soft tissue status, ability to perform physical daily living activities); and psychosocial status (coping skills and adjustment to the impairment). The patient's personal goals and expectations are also taken into consideration when formulating the treatment plan. Periodic reassessments are conducted as needed so that treatment and progress are monitored effectively.

Other types of evaluations performed frequently by occupational therapists include the following: (a) pre-operative evaluation to document pain, function, mobility, and sensation in order to effectively plan treatment; (b) following surgery, pre-vocational or vocational evaluation, including physical capacities evaluation, work-hardening, or job site analysis may be indicated when a patient plans on returning to work. The occupational therapist prepares written reports of the assessment results for the patient's record and referring physician. In the assessment documentation, the therapist also addresses the need for coordination of care with all persons involved.
Individual Program Planning

The program plan identifies the treatment goals, objectives, specific therapeutic procedures, and the frequency and duration of therapy. The patient's skills, psychological needs, and personal goals are considered in a comprehensive treatment plan. It is important that treatment of the hand be performed within the context of the total person and not as an isolated problem. A comprehensive treatment plan addresses all limitations and assets determined by the assessment.

When the patient can benefit from other services, the occupational therapist is responsible for recommending referrals to health professionals such as the orthotist, physical therapist, psychologist, social worker, or vocational rehabilitation counselor.

Individual Program Implementation

Program implementation requires the occupational therapist to consider the complexity and diversity of individual needs. The nature and extent of treatment vary considerably between management of the patient with hand impairment related to disease and deformity and management of the traumatic injury or post-surgical patient. The type of therapy and extent of team involvement is also related to the patient's role in society.

For management of hand impairment related to disease or deformity, the primary concerns of treatment are to prevent progression of limitation, reduce pain or discomfort, and improve mobility, function, dexterity, and strength. The primary concerns for the traumatic injury or post-surgical patient are the control of pain, inflammation, edema, stiffness, or adverse effects of adhesions and spasticity. Orthoses may be required to stretch contractures, prevent and correct deformities, shape scar tissue formation, and protect the surgical repair. Purposeful activities (physical daily living skills, crafts, work-related tasks, play and leisure skills) and therapeutic exercise are used to attain goals such as increasing range of motion, improving muscle strength, and normalizing tone. These modalities and approaches are also used to improve coordination and dexterity, which are essential to restoring the functional patterns of the hand. Patients experiencing problems in sensation may need to improve awareness, allow compensation through sensory re-education, or reduce hypersensitivity through desensitization. Patients with problems related to disease or deformity will also require some of the preceding treatment interventions.

Patients with hand dysfunction frequently have difficulties performing self-care and leisure activities. Retraining, environmental adaptations, assistive devices, and clothing modifications may be necessary to facilitate independent performance.

For patients returning to work, the program plan may include work hardening and tolerance activities. Many hand injuries occur where job demands include strenuous, dangerous, or highly skilled activities. For these patients, treatment focusing on restoring high-level strength and function may require adapting the patient's work tools or environment. Prevocational and vocational evaluation may also be required. Patients returning to a homemaking role may require further home assessment.

Rehabilitation after severe hand impairment requires a daily program. Only part of the daily program is administered in the clinic. The remainder is accomplished through a specifically designed home program. The patient and, when needed, a family member or friend are given specific written instructions in combination with verbal instructions for a home therapy program. Each person involved must demonstrate the ability to perform these activities before assuming responsibility for the home program.

In centers with group treatment, group process techniques help patients accept the hand injury and work through the psychological issues which can hinder the recovery process. These issues may include denial, guilt, shame, loss of self-esteem, depression, and anger. On an individual basis, treatment includes discussion and counseling to assist the patient in the adjustment process.

Discontinuation of Service

Termination of occupational therapy services occurs when the patient has achieved the program goals or has achieved maximum benefit from the program. Discharge and follow-up plans are developed collaboratively with patients, their families or significant others, and members of the hand rehabilitation team. Due to the complexity of hand problems, the discontinuation process is gradual and may include continued outpatient treatment in conjunction with a home program. Periodic reassessments are scheduled to ensure maintenance of function and the effectiveness of the home program.

Indirect Services

Indirect services such as management, supervision, quality assurance, consultation, and research are important components of a comprehensive hand rehabilitation program. Management is concerned with the delivery of effective care in a cost-efficient manner. The quality and appropriateness of occupational therapy services are monitored through the use of quality assurance programs, including participation in accreditation procedures.

Occupational therapists frequently provide consultation services to insurance companies, industry, schools, designers, and manufacturers of equipment. Ergonomics, work capacity, prehension, and environmental adaptations are some reasons for consultation.
Technological advances in hand rehabilitation offer ongoing opportunities for collaborative research to improve the quality of care for the hand patient.

Legal and Ethical Implications

The delivery of care for patients with hand dysfunction must be in accordance with state licensure laws, facility regulations, AOTA Standards of Practice (5), AOTA Principles of Occupational Therapy Ethics (6), and the Policy on Use of Modalities (7).

Confidentiality of records and reports must be maintained by occupational therapy personnel in conformance with local, state, and federal laws and regulations, policies of the institution or agency, and AOTA Principles of Occupational Therapy Ethics (6).

Summary

Occupational therapy makes a major contribution to the practice and continued development of hand rehabilitation. The unique combination of training in physical, functional, psychological, social, and vocational aspects of physical dysfunction enables the occupational therapist to provide comprehensive treatment necessary to return the patient with hand dysfunction to a productive life style.

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REFERENCES


RELATED READINGS

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