A New Practice Analysis of Hand Therapy

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ABSTRACT: The Hand Therapy Certification Commission, Inc. (HTCC) conducted a role delineation in 2001 to characterize current practice in the profession of hand therapy. Building upon previous HTCC studies of practice (i.e., Chai, Dimick & Kasch, 1987; Roth, Dimick, Kasch, Fullenwider & Taylor, 1996), subject matter experts identified the clinical behaviors, knowledge, and technical skills needed by hand therapists. A large scale survey was conducted with therapists across the United States and Canada who rated the clinical behaviors, knowledge, and technical skills in terms of their relevance to practice, and provided information about their own patient populations. A high survey return rate (72%) was indicative of the professional commitment of CHTs to their profession. Results of the survey are discussed and practice trends are identified. A new test outline for the Hand Therapy Certification Examination was created based on the results of the survey, and the 1987 Definition and Scope of Hand Therapy was revised. J HAND THER. 2002;15:215–225.

In 2001, the Hand Therapy Certification Commission, Inc. (HTCC), in consultation with Professional Examination Service (PES), completed a practice analysis of hand therapy. This was a follow-up to two previous studies performed in 1985[1] and 1994.[2] The primary rationale for performing the analysis in 2000–2001 was to update the current profiles of practice, including domains, tasks, knowledge, and skills, as well as the profiles of diagnostic categories and therapeutic procedures implemented across all settings in which hand therapists are employed.

The results of this practice analysis led to the revision of the existing test blueprint for the Hand Therapy Certification Examination. In turn, the results of the current study permitted refinement of the definition and scope of hand therapy that had been established on the basis of the original role-delineation study in 1985.

Two other purposes (which will be described in detail in separate publications) were also identified:

- *Comparisons of practice in other countries.* Over the past several years, representatives of a number of countries have contacted HTCC to enquire about an international credential. In addition, some certified hand therapists (CHTs) who were credentialed while residing in the United States or Canada now live and work in other countries. Since HTCC has not studied practice in other countries, those therapists have been unable to renew their credential using work hours obtained outside the United States and Canada. The Commission determined that studying three additional countries—Great Britain, Australia, and South Africa—would provide meaningful information that could be used for a variety of purposes.

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- *Identification of developmental patterns in clinical competencies.* The Commission was interested in obtaining information about the clinical competencies shown by therapists at the beginning of practice, during the early years of specialization, and after several years of specialization in hand therapy. This information was thought to be useful in assessing eligibility for the HTCC credential as well as in determining requirements for recertification and designing continuing education programs for therapists at all stages of professional development.

Hand Therapy Certification is a voluntary credentialing program established in 1989 by HTCC to certify occupational therapists and physical therapists in the advanced clinical specialty of upper quadrant rehabilitation. A CHT is an occupational therapist or physical therapist who has a minimum of 5 years of clinical experience, including 2,000 hours or more in direct practice in hand therapy. The CHT has successfully completed the comprehensive Hand Therapy Certification Examination, which is a test of advanced clinical skills and theory in upper quadrant rehabilitation.

The examination covers the broad knowledge required for clinical intervention as well as the basic science and theory that support clinical treatment. Test construction and administrative services are provided by PES. Certification is granted for a 5-year period, at which time a therapist must recertify by examination or with work experience and continuing education. The HTCC provides a recertification program to ensure that individuals maintain clinical competence once they have been certified initially. The first Hand Therapy Certification Examination was administered in 1991 and has been given annually since then.

From its inception, the Board of Directors of HTCC envisioned a two-step process of certification and recertification. The program serves the public and hand therapy community by maintaining high standards in the practice of hand therapy, enhancing the quality of patient care, recognizing occupational therapists and physical therapists who have achieved this advanced level of professional knowledge, and encouraging participation in continuing education and professional development.

METHOD

Development of Description of Hand Therapy Practice

An advisory committee of four therapists who participated in each of the previous two studies provided conceptual guidance and oversight during the course of the two-year study. The Advisory Committee invited occupational therapists and physical therapists from the United States and Canada who had subject-matter expertise in hand therapy to serve on the 14-member Practice Analysis Task Force (PATF). Diversity of geographic region, professional background, and practice setting were considered prior to inviting members.

The PATF was charged with developing an up-to-date description of hand therapy practice. The practice description had numerous elements. First, major domains of practice and specific tasks performed in each domain were described. Next, the knowledge used to perform the tasks that constitute practice was delineated. Additional elements of the practice description were the competencies required for effectiveness as a therapist, developmental progressions within competency areas, therapeutic techniques and tools used to treat patients, and the delineation of patient diagnostic categories as well as the medical/surgical reasons for referral.

The PATF nominated 21 additional subject-matter experts to participate in in-depth telephone interviews about the nature of their practices. Interviewees included experienced CHTs, employers and supervisors of credentialed and noncredentialed hand therapists, and representatives of the international hand therapy community. Results of the interviews were summarized for review by the PATF at its first meeting, in September 2000.

The elements of the practice description generated by the PATF were reviewed by 24 additional subject-matter experts who either participated in focus groups or reviewed the documents by mail. Three focus groups were held at the annual meeting of the ASHT in October 2000. Two additional focus groups were conducted at the therapy portion of the American Association of Hand Surgeons meeting in January 2001. Feedback from focus panelists and mail reviewers was used by the PATF to refine the hand therapy practice description at its second meeting, in March 2001.

Validation of the Practice Description

A large-scale mail-based survey was conducted to validate the hand therapy practice description developed by the PATF. First, a draft survey was reviewed by the PATF, revised, and pilot tested with a group of 21 therapists. Pilot test feedback was helpful in clarifying survey instructions, rating scales, and survey content. Finally, members of the PATF reviewed the results of the pilot survey and finalized the survey instrument.

To reduce the time demands on survey respondents, two versions of the survey were created, each containing about half the elements of the practice analysis.

- *Version A* of the survey contained questions about the domains of practice and associated tasks.

Survey respondents were asked to rate the percentage of time spent in each of the six major domains of practice, and the criticality of each domain to optimizing patient outcomes. Respondents were asked to rate each task in terms of frequency of performance during the past year and criticality to optimizing patient outcomes. This version of the survey also contained questions about referrals, including the diagnostic categories of patients, medical/surgical reasons for referral, and regions of the upper quadrant treated.

- *Version B* of the survey contained questions about the underlying knowledge used in hand therapy as well as the six major competency areas. Furthermore, the behavioral descriptions of novice, competent, and expert performance in each competency area were included. Respondents made three ratings for each knowledge statement—frequency of use during the past year, criticality to optimizing patient outcomes, and the point at which the knowledge should be acquired. Respondents rated each competency area in terms of criticality to their own effectiveness as hand therapists. Respondents were asked to rate the first point at which each behavioral descriptor of a competency was consistently demonstrated.

Both versions contained a section requesting information about the respondent's educational and professional background and an open-ended questionnaire regarding the completeness of the practice description contained in the survey, the perceived benefits of HTCC certification, and proposed services that HTCC might offer.

In the United States, where the number of CHTs is large, a stratified random sample of CHTs was selected from the HTCC database of CHTs. Stratification was designed to ensure adequate representation of recently certified hand therapists. A total of 1,079 CHTs in the United States were invited to participate. The entire population of Canadian CHTs ($N = 94$) was invited to participate.

Surveys were also distributed in Great Britain, Australia, and South Africa. Procedures and results related to the international distribution of the validation survey will be reported in a separate publication.

An invitation to participate in the validation survey was mailed in July 2001. Two weeks later, the validation survey was mailed with a cover letter, a postage-paid return envelope, and an application for continuing education credit. As an incentive, participants were offered 1.5 continuing education units (CEUs) for completing the survey. Finally, 10 days after the survey packets were mailed, a postcard was sent to each survey recipient. In the postcard, the survey recipients were thanked for their participation and asked to complete the survey if they had not already done so.

RESULTS

Demographics of Hand Therapists and Their Patients

The overall response rate for the survey of therapists in the United States and Canada was 72%. This is the highest response rate ever achieved for a survey of hand therapy practice (previous return rates were 50% in 1985 and 49% in 1994), and it is significantly higher than response rates for surveys of other health care professionals performed by PES. A higher percentage of Canadian therapists (79%) than U.S. therapists (71%) completed the survey.

Of the U.S. respondents, 85% were occupational therapists, 14% were physical therapists, and 1% indicated that they were dually credentialed. In contrast, of the Canadian sample, 49% were occupational therapists, 43% were physical therapists, and 8% indicated that they were dually credentialed. Respondents had an average of 14 years of hand therapy practice experience.

Forty-four percent of respondents worked in hospitals, 24% worked in therapist-owned practices, 17% worked in corporate-owned practices, 11% worked in physician-owned practices, and 4% worked in other practice settings.

Respondents' descriptions of their patient populations are presented in Table 1. Two diagnostic categories—cumulative trauma disorders and fractures/dislocations/joint instabilities—represented more than 50% of the patient population for more than 20% of respondents. Another three diagnostic categories—flexor/extensor tendon injuries, peripheral nerve compression and disease, and soft tissue injuries—represented at least 25% of the patient population for more than 20% of respondents.

Table 2 shows the medical/surgical procedures associated with patient referrals. Fracture fixations/bone grafts and nerve decompressions are the two medical/surgical procedures that result in the greatest number of patient referrals.

As seen in Table 3, respondents indicated that the primary reasons for referral could be related to each of the following regions of the upper quadrant—hand, wrist, elbow, shoulder girdle, cervical, or multiple joint. More than 40% of the respondents treat more than 50% of their patients for hand-related referrals, whereas more than 25% of the respondents treat more than 50% of their patients for wrist-related referrals. Although 59% of the respondents reported that they do not work with any patients with cervical-related referrals, 39% of the respondents indicated that between 1% and 25% of their patients had been referred for cervical-related reasons.

Table 4 shows the therapeutic procedures employed by survey respondents. Seven of the techniques and tools were used by the respondents with

TABLE 1. **Percentage of Respondents Who Indicated That a Specific Percentage of Their Patients During the Past Year Fell Within Each Diagnostic Category, in Descending Order of Overall Prevalence ($N = 395$)**

Diagnostic Category	*Percentage of Patients*					
	0	***1–10%***	***11–25%***	***26–50%***	***51–75%***	***76–100%***
Cumulative trauma disorders/repetitive stress injuries (e.g., rotator cuff tendinitis, DeQuervain's disease, bursitis, tenosynovitis, epicondylitis)	0	8	29	37	20	6
Fractures/dislocations/joint instabilities	0	7	30	41	18	4
Peripheral nerve compression and disease (e.g., carpal tunnel syndrome, thoracic outlet syndrome, double crush syndrome, diabetic neuropathy, Hansen's disease, neuritis)	1	17	38	28	13	3
Soft tissue injuries (e.g., acute injuries such as contusions and ligament injuries)	1	33	43	18	5	0
Flexor/extensor tendon injuries (e.g., laceration, rupture)	2	29	48	17	4	0
Inflammatory and degenerative arthritis (e.g., osteoarthritis, scleroderma, rheumatoid arthritis, fibromyalgia)	3	45	36	12	3	1
Multiple system trauma (e.g., crush injuries, gunshot wounds, amputations requiring replantation)	6	57	26	10	1	0
Pain-related syndromes (e.g., complex regional pain syndrome/ reflex sympathetic dystrophy, myofascial pain)	2	65	24	7	1	1
Peripheral nerve injuries (e.g., nerve laceration, Erb's palsy, brachial plexus conditions)	4	62	28	5	1	0
Dupuytren's contracture	9	58	25	7	1	0
Amputations (e.g., traumatic)	6	70	18	5	1	0
Infections (e.g., cellulitis, paronychia)	14	75	10	1	0	0
Tumors and cysts	18	72	10	0	0	0
Thermal injuries (e.g., burns, frostbite, electrical)	29	65	5	1	0	0
Nail injuries	33	61	5	1	0	0
Central nervous system disorders (e.g., cerebral palsy, central lesions, cerebrovascular accident) as they relate to the upper quadrant	41	51	7	1	0	0
Congenital differences/anomalies	50	48	2	0	0	0
Vascular disorders (e.g., Raynaud's syndrome, aneurysms)	51	48	1	0	0	0
Post-masectomy/post-radiation lymphedema	68	28	2	1	1	0
Psychogenic disorders involving the upper quadrant (e.g., clenched fist syndrome, Munchhausen syndrome)	76	24	0	0	0	0

TABLE 2. **Medical and Surgical Procedures Associated with Patient Referrals, in Descending Order of Frequency of Referral**

1. Fracture fixation/bone graft
2. Nerve decompressions
3. Tendon grafts/tendon repairs
4. Ligament repair
5. Arthoplasty
6. Soft tissue releases
7. Nerve grafts/nerve repairs
8. Tenolysis
9. Joint reconstruction
10. Tenosynovectomy
11. Use of pharmaceutical agents
12. Arthrodesis
13. Joint releases
14. Infections
15. Skin grafts/flaps
16. Tendon transfer
17. Neurolysis
18. Ganglionectomy
19. Joint synovectomy
20. Fasciectomy/fasciotomy
21. Replantation/re-vascularization
22. Amputation revision
23. Nerve blocks/sympathectomies
24. Scar revisions
25. Nailbed repair
26. Tissue transfers

TABLE 3. **Percentage of Respondents Who Indicated That, for a Specific Percentage of their Patients, the Primary Reason for Referral Was Related to a Region of the Upper Quadrant (N=401)**

Region of Upper Quadrant	*Percentage of Patients*					
	0%	*1%-10%*	*11%-25%*	*26%-50%*	*51%-75%*	*76%-100%*
Hand	0	1	12	46	28	13
Wrist	0	3	19	52	19	7
Elbow	1	27	43	22	5	2
Shoulder girdle	16	44	27	9	3	1
Cervical	59	33	6	2	0	0
Multiple joint	2	40	35	14	7	2

more than 50% of their patients—patient education, exercise, strengthening, thermal modalities, manual therapy, activity, and splinting. With only one exception (prosthetics), all the techniques were used by more than 80% of respondents in connection with one or more patients during the past year.

Use of Assistants in U.S. Practices

In the United States, only 21% of the respondents reported that they worked with either licensed or certified assistants, including physical therapist assistants (PTAs) or certified occupational therapy assistants (COTAs). The respondents were more likely to work with PTAs than COTAs in their practice settings. Assistants were most likely to spend their time implementing treatment plans; on average, more than 75% of their time was spent in this activity. They spend about 6% of their time organizing and managing services and no more than 4% of their time performing tasks in any other domain of responsibility. Finally, of the 157 persons who worked with licensed or certified assistants, about 60% indicated that it would be helpful if HTCC developed a certification program in hand therapy for these persons.

A secondary objective of the practice analysis was to obtain information about the use of certified assistants in hand therapy practices, to determine

TABLE 4. **Percentage of Respondents Who Used Hand Therapy Techniques and Tools During the Past Year, in Descending Order of Frequency of Use (*N* = 397)**

Technique or Tool	*Percentage of Respondents Who Did Not Use Technique/Tool*	*Percentage of Patients*		
		1%–25%	*26%-50%*	*More Than 50%*
Patient education	0	1	3	96
Exercise	0	0	8	92
Standardized and non-standardized assessment tools	1	3	6	90
Strengthening	0	1	38	61
Activity	1	5	33	61
Thermal modalities	1	6	43	50
Manual therapy	0	8	41	51
Splinting	0	10	67	23
Electrical modalities	3	27	54	16
Compressive therapy	3	28	62	7
Desensitization	0	35	60	5
Wound care/dressings/topical agents	2	44	48	6
Ergonomic modification	3	55	38	4
Sensory re-education	1	56	40	3
Adaptive/assistive devices	1	54	43	2
ADL training	6	59	30	5
Work hardening/retraining	14	51	32	3
Behavior management	17	51	26	6
Prosthetics	54	43	3	0

TABLE 5. **Domain Ratings: Mean and Standard Deviation for Percentage of Time Spent and Criticality***

Domain	% of Time		Criticality	
	Mean	SD	Mean	SD
Evaluate upper quadrant and relevant patient characteristics	20.3	8.5	4.0	0.1
Develop treatment and discharge plans	12.6	7.2	3.9	0.4
Implement treatment plans	44.5	16.9	4.0	0.2
Provide population-based services	4.8	7.8	2.6	0.8
Organize and manage services	9.8	9.5	3.0	0.8
Promote professional practice	7.2	7.0	3.1	0.8

*For criticality, 1 indicates not critical; 2, minimally critical; 3, moderately critical; 4, highly critical.

whether another level of certification is needed. The results of this survey indicate that the number of assistants is small, with only about 20% of the respondents reporting that they work with COTAs or PTAs. Clinics that employed assistants had only one to two assistants per facility, on average. It appears that therapy aides, who do not have any formal training, are more often used in practice. HTCC will continue to track the use of assistants to determine whether changes in practice warrant the development of a new certification program for assistants.

Validation of Domains, Tasks and Knowledge

The domains, tasks, and knowledge developed by the PATF were validated by survey respondents. The domain data are presented in Table 5. The percentage of time ratings show that, on average, respondents spent more than 75% of their time in direct patient care, including nearly 50% of their time implementing interventions. The three domains related to direct patient care (i.e., evaluate upper quadrant and relevant patient characteristics, develop treatment and discharge plans, and implement treatment plans) received an average rating indicating that the tasks associated with these domains were highly critical to optimizing patient outcomes. Two other domains, service management and promotion of professional practice, received an average rating of moderately critical, whereas the average rating of one domain, providing population-based services, indicated that the tasks associated with it were minimally to moderately critical. The pattern of domain ratings for the U.S. and Canadian respondents was virtually identical with regard to both time and criticality.

Without exception, the average rating of each task associated with every domain indicated that it was moderately to highly critical to optimizing patient outcomes. The average frequency with which tasks were performed was more varied. In general, tasks related to the three direct service domains were performed the most frequently (at least daily, on average), whereas tasks related to providing population-based services were performed the least frequently (rarely to occasionally, on average). The task with the lowest average frequency rating was participating in clinical research, which was rated as performed rarely or never. However, this same task was rated as making a moderate contribution to optimizing patient outcomes. The patterns of task ratings for the U.S. and Canadian respondents were generally similar for the frequency ratings and virtually identical for the criticality ratings.

Test Specifications

Hypothetical test specifications were derived by weighting equally the percentage of time and the criticality ratings for the U.S. and Canadian respondents for the domains. These hypothetical ratings were reviewed and compared with ratings made by the PATF members themselves at their final meeting, and final specifications were produced. As shown in Table 6, 88% of the specifications focus on the direct patient care domains—23% on evaluating patients, 15% on developing treatment and discharge plans, and 50% on implementing treatment plans. The remaining 12% focus on domains other than direct care—4% each on providing population-based services, organizing and managing services, and promoting professional practice. This blueprint was used to design the 2002 Hand Therapy Certification Examination.

The tasks validated for inclusion in the test specifications for the Hand Therapy Certification Examination are presented in the Appendix, entitled *Definition and Scope of Hand Therapy Practice.* These tasks met or exceeded threshold criteria, indicating that they were performed frequently and were critical to optimizing patient outcomes. The knowledge areas validated for inclusion in the test specifications are also presented in the Appendix. These knowledge areas met or exceeded threshold criteria, indicating that they were used frequently, were critical to

TABLE 6. **Final Test Specifications**

Domain	% of Examination
Evaluate upper quadrant and relevant patient characteristics	23
Develop treatment and discharge plans	15
Implement treatment plans	50
Provide population-based services	4
Organize and manage services	4
Promote professional practice	4

optimizing patient outcomes, and were necessary prior to specialized practice as a hand therapist. Accordingly, the validated lists of tasks and knowledge provide well targeted information to facilitate item writing and examination construction. Finally, the test specification and the associated results will be used to review and refine other components of the certification program, including the eligibility and recertification requirements.

Open-ended Comments

Completeness of Delineation

Because two forms of the survey were used, some respondents identified tasks or knowledge areas they believed were omitted from the survey. These were reviewed by the PATF at their final meeting. The task force verified that each task, and knowledge was included in the comprehensive structure of the delineation, attesting to the completeness of the delineation.

Benefits of HTCC Certification

Respondents identified benefits of certification. Fifty-five percent of respondents cited professional recognition as a benefit, making it the most frequently identified benefit of certification. Others benefits included personal satisfaction (51%), increased referrals (13%), increased salary (12%), increased career opportunities (12%), improved reimbursement (7%), and increased marketing opportunities (5%).

Proposed Services To Be Provided by HTCC

Both U.S. and Canadian respondents suggested that HTCC provide a directory of recommended resources and references, develop guidelines for self-assessment, and lobby for expanded recognition of the CHT credential by jurisdictions and insurers.

DISCUSSION

Evolution of the Model of Hand Therapy Practice

The conceptualization of practice that serves as the basis of the practice analysis has become more structurally robust since 1985. In 1985, the description was content based, including diagnostic categories and a limited list of knowledge categories. In 1994, a three-tiered typology was adopted, including domains of responsibility, behavioral tasks, and an expanded list of knowledge and skills in addition to the diagnostic categories. In 2001, the description was expanded to include a refined list of diagnostic categories as well as a list of treatment techniques and tools. A new dimension was added to the description—underlying professional competencies and behavioral descriptors.

TABLE 7. **Primary Practice Setting**

Primary Practice Setting	*1985 (N = 513)*	*1995 (N = 198)*	*2001 (N = 811)*
Hospital-based	47	43.4	44.1
Therapist-owned	28	24.7	23.6
Physician-owned	19	12.6	11.3
Corporate-owned	–	12.6	17.0
Other	11	6.5	3.9

NOTE. Multiple responses were permitted in the 1984 survey.

Between 1994 and 2001, the domains of responsibility were revised from seven to six domains. More important, the five domains related to direct patient care (assessment, development of treatment plans, implementation of treatment plans, evaluation of treatment, and development of discharge plans) were reorganized into only three domains (evaluation, development of treatment and discharge plans, and implementation of treatment plans). One new, non-direct-care domain (provision of population-based services) was added to the description.

Empirical Changes in Practice over Time

Because of the evolving concept of practice, the 1985, 1994, and 2001 surveys differ significantly in their organization. However, some comparisons can be made.

Practice Setting

The majority of respondents continue to work as staff therapists and senior therapists in hospital-based or therapist-owned practice settings. However, a marked increase in corporate-owned practice and a small decrease in hospital-based, therapist-owned, and physician-owned practices have occurred. This trend was first noticed in 1994 and continued in the 2001 data (Table 7). These changes in practice settings in which respondents were employed appear to reflect changes in health care, including the centralization of services and the shift to managed care.

Direct Patient Care and Other Activities

Hand therapists continue to spend most of their time in direct patient care, although they currently spend more time organizing and managing services and promoting professional practice than before.

Referral Diagnoses

Only limited comparisons of changes in the diagnostic categories treated by respondents in 1985, 1994, and 2001 can be made. In an attempt to refine and expand the 12 categories identified in the earlier studies, 20 categories were identified in 2001. Although different categories were employed, it is

possible to discern trends in the patterns of referral diagnoses. For example, in all three studies, cumulative trauma disorders/repetitive stress injuries and fractures/dislocations/joint dislocations were the most frequently cited diagnostic categories.

Research Activity

In 2001, fewer respondents described themselves as researchers than before. This number was very small in 1994 (7%) and is smaller now (less than 1%). This is not surprising, since therapists spend about 78% of their time in patient-related activities. Respondents continue to rate research as moderately important, however, indicating the ongoing need for research in hand therapy methodology.

Practice Trends

An unprecedented 72% of the surveys distributed were returned. In the previous two studies, about half the surveys were returned. This extraordinary return rate may indicate that hand therapy professionals have a high level of interest in and dedication to their profession. It also may indicate a desire to provide input into the description of practice. Many therapists expressed pride in being asked to participate in the focus groups and critical incident interviews and stated that they respect the work done by hand therapy organizations. They continue to feel that hand therapy practice has a unique role in health care.

In the United States, occupational therapists continue to be much more likely than physical therapists to become certified. In the United States, the ratio of occupational therapists to physical therapists who become CHTs is nearly 9:1, whereas in Canada the ratio is less than 1:1. This difference may reflect dissimilarity in the education and training of both groups in Canada, or it may reflect differences in the practice patterns of occupational therapists and physical therapists in Canada. It may be useful to identify such differences in the future.

The 2001 practice analysis augmented and validated the previous practice studies. Although changes in practice have occurred, areas related to direct patient care continue to have both high frequency and high criticality. Therefore, although both the original definition and the scope of hand therapy practice have been expanded—by the inclusion of a population-focused domain and all regions of the upper quadrant, for example—they maintain the elements that were initially adopted in 1985.

The practice analysis results suggest that therapists have changed the way they approach and manage hand therapy cases. In 1994, it was thought that changes in health care would bring about changes in the proportion of time spent in each domain, with less time spent implementing treatment plans and more time spent in discharge planning and in organizing and managing services. The reorganization of the domain structure from 1994 to 2001 precludes direct comparison of the time spent in each domain. Even so, it is clear that changes in health care brought about by managed care have affected the delivery of direct care services. Various aspects of direct care are now provided during a single patient–hand therapist visit, making it difficult to separate treatment planning from discharge planning, or treatment from evaluation. The delivery of direct care is far more integrated than it was previously—a practice trend that is reflected in the new domain structure.

It is apparent that hand therapy professionals spend more time organizing and managing services, such as human and fiscal resources, to ensure comprehensive patient care. Finally, the addition of a population-based services as a new domain reflects a new focus, namely, the delivery of care to entire groups in the context of their physical, social, occupational, and cultural environments.

The results of this practice analysis led to the revision of existing test specifications and the scope of content of the Hand Therapy Certification Examination. The 2001 model enables HTCC to expand the content of the examination by including a new domain (population-based treatment) and augmenting the structure of the scientific knowledge base, the technical skills, and the regions of the upper quarter.

In 1985, for example, hand therapy was focused more on the hand, wrist, and elbow. By 2001, the shoulder and cervical regions were being assessed and treated by hand therapists. This may reflect a more holistic approach to the treatment of cumulative trauma disorders and other conditions that are referred to hand therapists. For example, static posturing and long hours at the computer may be addressed by hand therapists providing population-based services, which will include the entire upper quarter to industry.

Another significant change in the 2001 practice analysis was the inclusion of a new dimension of technical skills. In 1994, it was felt that the 1985 survey had been too focused on techniques, with a resulting lack of emphasis on the scientific knowledge base. In the 1994 survey, the delineation of the knowledge base was expanded, and techniques used by practitioners were, perhaps, considered less. In 2001, a list of techniques and tools was included to complete the triad of clinical behaviors, knowledge, and skills needed to perform in this specialty area. Use of techniques and tools represents very focused skills, which can readily be used for self-assessment and as the focus of continuing education. When combined with clinical competency measures, such as the employment of sound clinical reasoning, they can be used to establish both the content and level of continuing education.

The expansion of the list of diagnostic categories and the inclusion of related medical/surgical condi-

tions will allow HTCC to track trends in practice more carefully in the future. For example, it appears that the high incidence of referral for cumulative trauma is related to a high incidence of nerve decompression prior to referral. The diagnoses may also reflect the general aging of society and the more sedentary nature of work. Tracking of these dimensions could serve as a basis for continuing education planning, public education, and the development of training programs for new therapists, as well as influencing the blueprint for the Hand Therapy Certification Examination.

Revised Definition of Hand Therapy

Finally, the results also permitted a revision of the definition of hand therapy that had been adopted by ASHT members in April 1987. The updated definition reflects a more holistic approach to practice and includes the entire upper quarter, as confirmed by the results of the study. The following definition of hand therapy was adopted by the Board of Directors of the Hand Therapy Certification Commission in May 2002:

> *Definition of Hand Therapy:* Hand therapy is the art and science of rehabilitation of the upper quarter of the human body. Hand therapy is a merging of occupational therapy and physical therapy theory and practice that combines comprehensive knowledge of the upper quarter, body function, and activity. Using specialized skills in assessment and treatment, hand therapists promote the goals of prevention of dysfunction, restoration of function and/or reversal of the progression of pathology in order to enhance participation in life situations for individuals with upper quarter disease or injury.

At the same time, members of the Commission reviewed and revised the associated scope of practice. The scope of practice was modified to reflect the major domains of practice and associated tasks, scientific knowledge base of hand therapy, descriptions of hand and upper quarter patients, and validated treatment techniques and tools. The Appendix contains a copy of the revised scope of practice of the profession of hand therapy.

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For more information about hand therapy certification, please contact the HTCC at www.htcc.org or 800-860-7097.

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1. Chai SH, Dimick MP, Kasch MC. A role delineation study of hand therapy. J Hand Ther. 1987; 1:7–16.
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APPENDIX

Definition of Hand Therapy and Scope of Practice of Certified Hand Therapists

Definition of Hand Therapy

Hand therapy is the art and science of rehabilitation of the upper quarter of the human body. Hand therapy is a merging of occupational therapy and physical therapy theory and practice that combines comprehensive knowledge of the upper quarter, body function, and activity. Using specialized skills in assessment and treatment, hand therapists promote the goals of prevention of dysfunction, restoration of function and/or reversal of the progression of pathology in order to enhance participation in life situations for individuals with upper quarter disease or injury.

Who Are Hand Therapists?

Hand therapists are certified or licensed occupational therapists or physical therapists who, through advanced continuing education, clinical experience, and independent study have become proficient in the treatment of pathologic upper-quarter conditions resulting from trauma, disease, or congenital or acquired deformity. A Certified Hand Therapist (CHT) is an occupational therapist or physical therapist who has met the standards established by the Hand Therapy Certification Commission, Inc.

Scope of Practice and Domains of Hand Therapy

The Scope of Practice of Hand Therapy may include one or more of the domains described below. Domains describe major areas of responsibility in hand therapy. The first three domains include assessment and treatment of hand patients. In compliance with state and federal law, treatment is based on the results of assessment and may be provided on a one-to-one basis, in a group, or by consultation. The fourth domain describes services to specific population

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groups. The final two domains describe activities associated with professional practice. The domains and their associated tasks are listed below:

Evaluate Upper Quarter and Relevant Patient Characteristics

Obtain and review medical, psychosocial, and vocational history; Interview patient; Plan for and select assessment tools; assess and document skeletal, muscular, nervous, vascular, skin and connective tissue status, functional and/or ergonomic status, and psychosocial factors; reassess and document patient status at appropriate intervals.

Develop Treatment and Discharge Plans

Integrate theoretical knowledge bases and patient goals into treatment; establish short-term and long-term goals of treatment; establish frequency of treatment in collaboration with patient and referring physician and within the guidelines of third party payers; determine rehabilitation potential; select appropriate treatment techniques; identify appropriate resources to which patients can be referred; consult with and refer to other health care professionals; document the treatment plan; assess readiness and determine discharge needs including return to work; formulate and document discharge plan.

Implement Treatment Plans

Implement and modify treatment/interventions to address edema/vascularity, pain, scar, range of motion /flexibility, wounds, strength, dexterity, sensation, function, endurance, and posture/movement.

Provide Population-based Services

Determine needs of the target population (e.g., industrial, athletic, and performing artist groups); make intervention recommendations (e.g., education programs, prevention strategies, ergonomic modifications, and screening) based on available resources; assist in implementation of interventions; monitor effectiveness of interventions; serve as a resource person/consultant.

Organize and manage services

Comply with regulations that ensure environmental safety; advocate for patients; ensure compliance with organizational policies and procedures; participate in case management; assess patient satisfaction.

Promote professional practice

Maintain ethical and legal standards; participate in evidence-based (i.e., scientifically-based, outcome-based) practice; interpret and apply clinical research and outcome studies.

Scientific Knowledge Basis of Hand Therapy

The foundation of hand therapy is comprehensive understanding of:

- Surface anatomy
- Anatomy and physiology of the skin/connective, muscular, skeletal, nervous, and vascular/lymphatic systems
- Physical properties (e.g., heat, water, light, electricity, and sound)
- Wound healing
- Behavioral science, and psychological reactions to impairment
- Research design and statistics
- Kinesiology and biomechanics
- Posture and pathomechanics
- Etiology and pathology of medical conditions
- Surgical and medical treatment of conditions
- Standardized and non-standardized assessment tools
- Treatment rationale, indications and contraindications
- Treatment methods, techniques, and tools
- Expected functional outcomes of treatment
- Expected physiological and psychological effects of treatment procedures
- Regulatory and legal guidelines
- Resource management
- Professional codes of ethics
- Safe and appropriate use and maintenance of equipment and assistive devices
- Safety techniques and procedures (e.g., infection control, emergency procedures, practitioner safety, environment)

Hand and Upper Quarter Patients

Theoretic knowledge and technical skills are applied, using good clinical judgment, in assessment and treatment of individuals with diagnoses related to the upper quarter (hand, wrist, elbow, shoulder girdle, cervical area or multiple joints). These may include but are not limited to:

- Amputations
- Central nervous system disorders as they relate to the upper quarter
- Congenital differences/anomalies
- Cumulative trauma disorders/repetitive stress injuries
- Dupuytren's contracture
- Flexor/extensor tendon injuries
- Fractures/dislocations/joint instabilities
- Infections
- Inflammatory and degenerative arthritis
- Multiple system trauma
- Nail bed injuries
- Pain-related syndromes
- Peripheral nerve compression and disease
- Peripheral nerve injuries
- Post-mastectomy/post-radiation lymphedema
- Psychogenic disorders involving the upper quarter
- Soft tissue injuries

- Thermal injuries
- Tumors and cysts
- Vascular disorders

Such patients may be referred to a hand therapist following a variety of medical or surgical interventions including:

- Amputation revision
- Arthroplasty
- Arthrodesis
- Fasciectomy/fasciotomy
- Fracture fixation/bone graft
- Ganglionectomy
- Injections
- Joint reconstruction
- Joint releases
- Joint synovectomy
- Ligament repair
- Nail bed repair
- Nerve blocks/sympathectomies
- Nerve decompressions
- Nerve grafts/nerve repairs
- Neurolysis
- Replantation/re-vascularization
- Scar revisions
- Skin grafts/flaps
- Soft tissue releases
- Tendon grafts/tendon repairs
- Tendon transfer
- Tenolysis
- Tenosynovectomy
- Tissue transfers
- Use of pharmaceutical agents

Treatment Techniques and Tools

A variety of techniques and tools may be used in therapeutic intervention with hand and upper quarter patients, including but not limited to:

- Activity
- Adaptive/assistive devices
- Training in activities of daily living (ADLs)
- Behavior management
- Compressive therapy
- Desensitization
- Electrical modalities
- Ergonomic modification
- Exercise
- Manual therapy
- Patient and family education
- Prosthetics
- Sensory re-education
- Splinting
- Standardized and non-standardized assessment tools
- Strengthening
- Thermal modalities
- Work hardening/retraining
- Wound care/dressings/topical agents

—ADOPTED BY HTCC BOARD OF DIRECTORS
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