

PRACTICE ANALYSIS OF HAND THERAPY

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Practice Analysis of Hand Therapy

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The Hand Therapy Certification Commission, Inc. (HTCC), in consultation with Professional Examination Service (PES), performed a practice analysis of hand therapy in September 1994. This was a follow-up to a role-delineation study of hand therapy performed in 1985 by the Certification Committee of the American Society of Hand Therapists (ASHT).¹ The rationale for performing another analysis of hand therapy in 1994 was to re-evaluate hand therapy practice and to incorporate the results of this study into the Hand Therapy Certification Examination (HTCE) by updating test items and assembling the examination to reflect current practice. The results of this practice analysis led to the revision of existing test specifications and determined the scope of the content of the HTCE.

The purpose of the 1985 ASHT study was to define hand therapy and its scope of practice; to identify educational objectives for hand therapy; to provide data for further research into the characteristics of the profession; and to establish the basis for a formal process of certification in hand therapy. The initial study became the foundation for the official definition and scope of practice of hand therapy,² which was adopted by the membership of the ASHT in April 1987. The results of the role-delineation study have served as the blueprint for the HTCE, which was first administered in 1991.

ABSTRACT: In 1994, a practice analysis (role delineation study) was conducted on the profession of hand therapy. This study was conducted as a follow-up to the original study conducted by the American Society of Hand Therapists (ASHT) in 1985. A representative group of content experts developed a description of hand-therapy practice, and this description was validated using a questionnaire. The questionnaire was distributed to a random sample of 400 certified hand therapists (CHTs), of whom 50% responded. The respondents provided confirmation of the accuracy of the description of hand therapy. The survey results were used to update the test specifications for the Hand Therapy Certification Examination. The results enabled the Hand Therapy Certification Commission to improve upon its certification program by clarifying and expanding the definition of hand therapy. The 1994 findings were also compared with the results of the 1985 study. *J HAND THER* 9: 203-212, 1996.

The HTCC is a not-for-profit corporation established in 1989 for the purpose of sponsoring a volunteer certification program. The program's goal is to test and recognize the knowledge and skills of occupational therapists and physical therapists specializing in upper extremity rehabilitation. The HTCE is a comprehensive test that covers the broad knowledge required for the advanced specialty of upper extremity rehabilitation. This knowledge encompasses not only clinical intervention but also the basic science and theory required to support clinical treatment. Test construction and administrative services for the HTCE are provided by Professional Examination Service (PES). The HTCE has been administered annually since 1991.

The purposes of the certification program are to serve the public and hand therapy community by maintaining high standards in the practice of hand therapy; to enhance the quality of patient care; to identify occupational therapists and physical therapists who have achieved this advanced level of professional knowledge; and to encourage participation in continuing education and professional development.

METHOD

Practice Analysis Document

The first phase of the practice analysis conducted in the fall of 1994 involved the assembly of a representative group of individuals with content

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expertise in hand therapy. Under the guidance of PES, six certified hand therapists joined as a task force to provide the subject-matter expertise necessary to define contemporary practice. The practice analysis (role delineation, job analysis) was based on a content-validity model consistent with the Standards for Educational and Psychological Testing³ prepared by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education. The content-validity model emphasizes the need to conduct a practice analysis to ensure that the professional knowledge and skills assessed in a credentialing program are, in fact, limited to those required for competent performance and that the credentialing program can therefore be assured of serving a public protection function.

This model requires that the content domain covered by hand therapy practice be accurately and comprehensively defined. To meet this goal, the practice analysis was delineated from two complementary perspectives—a *content-based* approach and a *process-based* approach. The content-based approach involved defining hand therapy practice in terms of requisite knowledge and skills, as well as by examining the nature of practice through an assessment of diagnostic categories that hand therapists work with. The process-based approach included the delineation of hand therapy in terms of actual professional practice, defining the profession in terms of the work behaviors that make up hand therapy. The content-based approach affords a conceptually meaningful way to define practice and communicate effectively with practitioners, educators, and the professional community. The process-based approach ensures that the profession is defined accurately within a practice-related framework. Together, these perspectives serve the overall goal of hand therapy certification by precisely defining practice and by facilitating effective item and examination development work for certification.

The practice-analysis document that was generated included the specification of hand therapy practice at three interrelated, but different, levels of analysis. First, practice was defined in terms of broad areas of responsibility or *domains of practice*. These domains incorporated the process perspective and included patient assessment; the development, implementation, and evaluation of treatment; and discharge-plan development. Within the domains of practice, a second level of analysis directed at specific, goal-directed work activities or *tasks* was identified. These task statements describe the performance of a specific work activity, the goal of that activity, and how it is accomplished. The patient-assessment domain includes such tasks as interviewing, observing, and palpating patients to assess their conditions. The third level of analysis identifies the *knowledge* and *skills* necessary to effectively perform a work task. Knowledge statements are organized bodies or sets of information that are theoretical, factual, or procedural in nature. Skill statements are measurable, acquired competencies. The hand therapy practice-analysis document included over 50 different knowledge and skill areas, such as be-

havior-management techniques, surgical and medical treatment of conditions, kinesiology, anatomy, and so on. The three levels of analysis structure of the practice analysis, combining process and content approaches, enabled the development of a comprehensive scope of practice document and advanced the definition of the profession beyond the original role delineation conducted in 1985.

Tables 1 and 2 compare the 1985 role delineation, which assessed activities, skills and modalities, with the current practice analysis. The most pronounced difference between these delineations is the organizational structure of the descriptions. A close examination of the documents indicates that many of the clinical practices engaged in by hand therapists remain the same or similar. The 1994 practice analysis provides a more extensive accounting of the knowledge and skills underlying hand therapy practice. In addition, domains assessing the promotion of professional practice and the organization and management of services have been included. This change may be the result of the increasing role played by managed care in the provision of hand therapy services and may also reflect the profession's growing understanding of what is required to ensure the competent provision of professional services.

Validation Survey

The second phase of the practice analysis study involved the development and dissemination of a validation survey. The purpose of the survey was to validate or confirm the initial findings of the task force. The survey was constructed by psychologists with expertise in test development and statistical measurement. The survey comprised three separate components. The first portion contained 17 demographic questions designed to assess relevant background characteristics of the survey respondents. The second portion of the survey contained domain and task statements and diagnostic categories defined in the practice analysis. Survey respondents were required to rate each domain statement and diagnostic category in terms of the percentage of time they spent in each practice area. Domain statements were also rated in terms of their importance to competent practice as a hand therapist. Task statements were rated on the following three dimensions: *importance* of the task to competent practice, *frequency* of performance as a hand therapist, and *criticality* of competent performance in ensuring a safe level of clinical practice. These scales are presented in Table 3.

The third section of the survey consisted of four open-ended questions requiring respondents to indicate any domains, work tasks, knowledge, or skills that might have been omitted from or incorrectly included in the practice-analysis document.

The validation survey was mailed in mid-September 1994 with a covering letter explaining the purpose of the survey. The entire practice-analysis document was also included in the package to allow a complete review by practicing hand thera-

pists. Approximately three weeks after the survey was mailed, a follow-up postcard was sent to participants requesting that they complete the survey if they had not already done so.

Sample

The certification of hand therapists began nationally in 1991. In 1994, when the validation study

was being prepared for distribution, the total population of certified hand therapists (CHTs) was approximately 1,800 individuals. A random sample of 400 CHTs was drawn from this population to receive the survey. Of the 400 individuals sampled, 199 completed and returned their surveys. This represents a 50% response rate, which is quite high. The response rate was also consistent with the 1985 survey response rate of 49%.

TABLE 1. Results of the 1985 Role Delineation Study

Domains of activities, skills, and modalities

1.0 Wounds and scars	
1.1 Topographical evaluation	Skin; structures; deformities; masses; patient posturing
1.2 Wound management	Whirlpool; débridement; dressings; electrical stimulation
1.3 Scar management for hypertrophy	Pressure techniques; splinting; vibration; massage
1.4 Scar management for adhesions	Heat; vibration; massage; splinting; continuous passive motion (CPM)
2.0 Edema	
2.1 Evaluation of edema	Volume; circumference
2.2 Techniques of edema control	Compression garments; mechanical compression; manual compression; contrast baths
3.0 Pain	
3.1 Evaluation of pain	Psychosocial adjustment; pain analog; body charting
3.2 Techniques of pain control	Desensitization; TENS
4.0 Neurovascular and neuromuscular	
4.1 Assessment of vascularity	
4.2 Peripheral nerve evaluation	Motor and sensory assessment; clinical signs of nerve dysfunction
4.3 Sensory re-education	
4.4 Nerve conduction/EMG	
4.5 Peripheral nerve splinting	
4.6 Manual muscle testing	
4.7 Muscle re-education	
4.8 Musculoskeletal splinting	
5.0 Range of motion (ROM)	
5.1 Evaluation of ROM	Active ROM; passive ROM; passive assessment; torque ROM; total active motion; total passive motion
5.2 Treatment of ROM	Passive ROM; active ROM; active-assistive ROM; resistive exercise; resistive activities; splints
6.0 Strength and dexterity	
6.1 Evaluation of strength	Grip; pinch; endurance
6.2 Strengthening techniques	Resistive exercise, resistive activities
6.3 Evaluation and treatment	Use of standardized dexterity tests; functional activities; activities of daily living (ADL); work simulation
7.0 Prosthetics and orthotics	
7.1 Prosthetic evaluation and training	Body-powered prostheses; externally powered prostheses; aesthetic prostheses
7.2 Orthotic fabrication and training	Custom splints; commercial splints; casting; custom adaptive equipment
8.0 Work evaluation and conditioning	
8.0 Work evaluation and conditioning	Job analysis; work capacity evaluation; work simulation; work hardening
9.0 Techniques and modalities	
9.1 Heat and cold	Ultrasound; paraffin; hot packs; fluidotherapy; cryotherapy; whirlpool
9.2 Manual therapy	Joint mobilization; myofascial techniques; other soft tissue techniques
9.3 Electrophysiological techniques	TENS; temperature biofeedback; iontophoresis; phonophoresis; electrical stimulation

Domains of knowledge

Anatomy

Histology

Physiology

Kinesiology

Physics

Surgery

TABLE 2A. 1994 Practice Analysis, Domains and Tasks

<i>Domain</i>	<i>Task</i>
1.0 Assess upper extremity and relevant patient characteristics (evaluate the patient by interviewing, observing, palpating, and performing tests and measurements to determine functional and physical status)	1.1 Obtain history and psychosocial conditions 1.2 Interview patient 1.3 Plan and select assessment tools 1.4 Observe and palpate to assess patient condition 1.5 Assess skeletal, muscular, nervous, vascular, skin/connective status (e.g., edema, pain, ROM) 1.6 Assess functional status (e.g., dexterity, ADL, vocational and avocational status) 1.7 Interpret and document the results of the evaluation
2.0 Develop treatment plan (integrate assessment/evaluation results to determine the treatment techniques necessary to achieve measurable goals)	2.1 Integrate theoretical knowledge bases into treatment 2.2 Establish long-term and short-term goals of treatment 2.3 Establish frequency of treatment with referral source 2.4 Analyze treatment techniques available to facilitate achievement of goals (e.g., activities, modalities, tools and equipment) 2.5 Consult with and refer to other health care professionals 2.6 Document the treatment plan
3.0 Implement treatment plan (determine and implement the proper sequence of treatment techniques to achieve treatment goals)	3.1 Implement therapeutic exercise program 3.2 Treat soft tissue pathology (e.g., cumulative trauma, myofascial conditions) 3.3 Restore and maintain ROM 3.4 Modify edema and its effects 3.5 Modify pain and its effects 3.6 Enhance vascularity 3.7 Management of wounds and scars 3.8 Fabricate and/or apply orthotic, prosthetic, or assistive devices 3.9 Teach and modify ADL, function, and dexterity 3.10 Instruct patient and family in the treatment program
4.0 Evaluate treatment (monitor, reassess, and compare patient status and progress to evaluate effectiveness of treatment plan in achieving treatment goals; make modifications where indicated)	4.1 Interview patient 4.2 Reassess and document patient status 4.3 Interpret results of evaluation 4.4 Modify treatment
5.0 Develop discharge plan (provide education and skills to reintegrate the patient into vocational and avocational activities and maintain functional gains)	5.1 Assess readiness and determine discharge needs 5.2 Formulate discharge plan 5.3 Educate the patient and family 5.4 Document discharge plan
6.0 Organize and manage services (organize and manage human and fiscal resources necessary to provide continuous and consistent quality patient care)	6.1 Maintain ethical and legal standards 6.2 Maintain a safe environment 6.3 Develop and maintain systems to ensure quality care 6.4 Assure compliance with organizational policies and procedures
7.0 Promote professional practice (foster and develop competence in the profession through continuing education, ethical practice, and research)	7.1 Participate in continuing professional education 7.2 Participate in education and interpretation of relevant research affecting practice 7.3 Participate in activities and associations that advance professional practice and public welfare 7.4 Ensure ongoing competence in the provision of patient care

TABLE 2B. 1994 Practice Analysis, Knowledge and Skills

1. Interview and communication skills	15. Anatomy and physiology of the nervous system
2. Individual differences (e.g., sociocultural, age, gender)	16. Surgical and medical treatment of conditions
3. Appropriate information resources (e.g., publications, medical records, supplies and equipment)	17. Test administration procedures
4. Etiology and pathology of medical condition	18. Normal values of motion
5. Pathological conditions associated with vocational and avocational activities	19. Normal values of strength
6. Indications and contraindications of patient condition	20. How deficit affects function
7. Standardized and non-standardized assessment tools (including consideration of reliability)	21. Reporting skills
8. Appropriateness of assessment tools	22. Physical properties (e.g., heat, water, light, electricity, and sound)
9. Surface anatomy	23. Expected physiological and psychological effects of treatment procedures
10. Posture and pathomechanics	24. Treatment indications and contraindications
11. Anatomy and physiology of the skeletal system	25. Kinesiology and biomechanics
12. Anatomy and physiology of the muscular system	26. Histology
13. Anatomy and physiology of the skin/connective tissue system	27. Types and functions of orthotic devices
14. Anatomy and physiology of the vascular system	28. Types and functions of prosthetic devices

Continued →

TABLE 2B. 1994 Practice Analysis, Knowledge and Skills

29. Types and functions of assisted devices and adaptive equipment	39. Compensatory techniques (e.g., work simplification)
30. Expected functional outcomes of diagnosis	40. Safety techniques and procedures (e.g., infection control, emergency procedures, practitioner safety, environment)
31. Physiological effects of pharmaceutical agents	41. Instruction methods
32. Goal-setting techniques	42. Anticipated progression based on medical condition
33. Knowledge of individual patient resources (e.g., finances, family support, compliance)	43. Grading of treatment techniques to achieve goals
34. Availability of external resources and knowledge of their roles in hand therapy treatment (e.g., community agencies, other health care professionals, supplies and equipment)	44. Patient rights
35. Exercise principles and their application	45. Regulatory and legal requirements
36. Safe and appropriate use and maintenance of equipment and assistive devices	46. Professional and legal requirements
37. Psychological reactions to disability and pain	47. Personnel roles, policies, and procedures
38. Behavior management techniques	48. Appropriate clinical resource management
	49. Self-assessment and performance appraisal techniques
	50. Hand therapy theories and techniques
	51. Development and current trends in medical practice
	52. Societal trends affecting practice
	53. Research design and statistics

TABLE 3. Importance, Frequency, and Criticality Scales

<i>Importance</i> <i>How important is the performance of this task to competent practice as an entry-level hand therapist?</i>	<i>Frequency</i> <i>How frequently do you perform this task?</i>	<i>Criticality</i> <i>How critical is the competent performance of this task to ensuring a safe level of clinical practice and ensuring public protection?</i>
1. Not important	1. Never (no occasion to perform this task)	1. Not related to safety
2. Minimally important	2. Rarely (I perform this task with less than 10% of my patients/clients)	2. Necessary for safety
3. Moderately important	3. Infrequently (I perform this task with a minority of my patients/clients)	3. Critical for safety
4. Extremely important	4. Frequently (I perform this task with a majority of my patients/clients)	
	5. Extremely frequently (I perform this task with almost every patient/client)	

RESULTS

Demographics

Eighty-eight percent of the sample were occupational therapists (OTs), 10% were physical therapists (PTs), and 2% indicated they were both occupational and physical therapists. Seventy percent of respondents indicated they were members of the American Occupational Therapy Association (AOTA), and 9% were members of the American Physical Therapy Association (APTA). Sixty-eight percent were members of the American Society of Hand Therapists (ASHT), and 8% were members of the American Association of Hand Surgery (AAHS).

The sample was geographically representative, with 31% of respondents practicing in the Midwest, 22% practicing in the Northeast, 18% practicing in the West, and 10% practicing in the Southwest. The smallest number of survey participants (2%) was from the Northwest. Table 4 provides a detailed summary of the regions represented by the sample.

The sample of survey respondents was representative and normally distributed in regard to the number of years of licensed or certified practice as an OT or PT as well as in regard to the number of

years of casework with upper extremity patients. The largest percentage of respondents (25%) had been licensed or certified for 14 to 16 years. The largest percentage of respondents (34%) had maintained caseloads of 50% or more upper extremity patients for seven to ten years. Tables 5 and 6 summarize these data.

Many respondents reported spending most of their work time in patient care. Seventy percent of respondents reported that they were involved full time in patient care, 22% spent half their time in patient care, and 5% spent a fourth of their time in patient care. Only 3% reported spending no time providing patient care.

TABLE 4. Indicate the Area of the Country in Which You Currently Practice

	<i>Frequency*</i>	<i>Percent</i>
Northeast	44	22.2
Middle Atlantic	10	5.2
Southeast	14	7.1
South	9	4.5
Midwest	63	31.8
West	35	17.7
Northwest	4	2.0
Southwest	19	9.6

*Missing = 1.

TABLE 5. How Many Years Have You Been Certified or Licensed as an Occupational Therapist or Physical Therapist

	Frequency	Percent
Fewer than 5	—	—
5-7	17	8.5
8-10	38	19.1
11-13	39	19.6
14-16	50	25.1
17-20	34	17.1
21-24	8	4.0
25 or more	13	6.5

TABLE 6. How Many Years Have You Maintained a Case Load of 50% or More Upper Extremity Patients?

	Frequency	Percent
1-2	1	0.5
3-4	14	7.0
5-6	44	22.1
7-10	68	34.2
11-14	46	23.1
15-19	20	10.1
20-24	5	2.5
25 or more	1	0.5

Demographic questions relating to the characteristics of current practice indicated that the largest number of respondents were working as either senior therapists (27%) or staff therapists (25%) in hospital-based outpatient settings (42%) or in therapist-owned practices (25%). Relatively few therapists were educators (2%), and only 1% of respondents reported working in a hospital-based in-patient facility. Seven percent of respondents indicated they currently worked as researchers. Analyses of the frequencies with which therapists handled 12 common diagnoses of the upper extremity indicated that, on average, 26% of their practice time was spent on cumulative trauma and soft-tissue disorders. Twenty-one percent of their practice time was spent on fractures and dislocations. The least time was spent working with tumors (1%), congenital anomalies (1%), and thermal injuries (2%). Tables 7 through 9 summarize these current practice data.

Practice Analysis Validation

The results from the survey ratings of domains, work tasks, knowledge, and skills provide strong support for the practice-analysis document generated by the task force of content experts. Each of the seven domains described in the practice analysis received average importance ratings of moderately important or greater. Those domains involving assessment, treatment-plan development, treatment-plan implementation, and treatment evaluation received average ratings of extremely important. Table 10 contains mean ratings and frequency ratings of the importance of dimensions for each of the domain areas. Table 11 presents the average amount of time respondents reported spending in each domain. Hand therapists reported spending 33% of their time in domain three, which

involves implementing a treatment plan. Eighteen percent of their time was spent in assessing upper extremities and patient characteristics, followed by 14% of their time being spent on evaluating treatment. Eight percent of respondents' time was spent on each of the remaining three domains: discharge planning, organizing and managing services, and promoting professional practice.

Work-task ratings of importance, frequency, and criticality paralleled the findings associated with the seven domains described above. All of the 39 tasks in the practice analysis were rated as being of moderate or greater importance and were frequently performed by most respondents. Table 12 contains the mean frequency, importance, and criticality ratings for each task. Two tasks in the assessment domain were rated as extremely important and very frequently performed. These tasks involved (1) assessing the skeletal, muscular, nervous, vascular, and skin/connective status and (2)

TABLE 7. Which of the Following Titles Best Describes Your Present Position?

	Frequency	Percent
Staff therapist	50	25.1
Senior therapist	54	27.1
Clinic supervisor	40	20.1
Department supervisor	23	11.6
Facility supervisor	15	7.5
Educator	3	1.5
Researcher	14	7.0
Student	—	—
Other	—	—

TABLE 8. Which of the Following Best Describes the Facility in Which You Work?

	Frequency*	Percent
Hospital-based practice (inpatient)	2	1.0
Hospital-based practice (outpatient)	84	42.4
Therapist-owned practice	49	24.7
Physician-owned practice	25	12.6
Corporate-owned practice	25	12.6
Health maintenance organization	5	2.5
Other	8	4.0

*Missing = 1.

TABLE 9. Please Indicate What Percentage of Your Practice is Spent in Each Diagnostic Category

Diagnostic Category	Percent of Practice
1. Amputations	5.8
2. Congenital anomalies	1.2
3. Cumulative trauma disorders/soft-tissue disorders/myofascial pain	26.3
4. Fractures/dislocations	20.5
5. Infections	3.2
6. Multiple system trauma (e.g., replantation)	4.7
7. Peripheral nerve dysfunction	9.5
8. Rheumatic diseases	6.3
9. Tendon disorders	13.1
10. Thermal injuries (e.g., burns, frostbite)	2.3
11. Tumors	1.3
12. Reflex sympathetic dystrophy (RSD)	5.2

interpreting and documenting the results of an evaluation.

In domain area two, which involved developing the treatment plan, the task of analyzing treatment techniques available to facilitate the achievement of goals was rated as extremely important. The lowest rating was for establishing the frequency of treatment with a referral source. For this task, 18% of respondents considered it to be of minimal or less importance. Nineteen percent of respondents performed this same task less than frequently. Forty-one percent of respondents indicated that they consulted with and referred to other health care professionals infrequently or rarely.

In the domain area of treatment-plan implementation, the following three tasks were rated as extremely important: implementing a therapeutic exercise program, restoring and maintaining range of motion (ROM), and modifying the effects of edema. The lowest-rated tasks involved enhancing vascularity and teaching and modifying activities of daily living (ADL), function, and dexterity. Four and one-half percent of respondents thought enhancing vascularity was of minimal or lower importance, and 27% reported performing this task infrequently or less. Twenty-two percent of candidates reported that they did not reach or modify

TABLE 10. Domain Ratings of Mean Importance and Importance Frequency Responses

Domain	Mean Importance	Importance Frequency Responses (% of respondents selecting each choice)	
1. Assess upper extremity and relevant patient characteristics	4.0	Not important	0.5
		Minimally important	0.0
		Moderately important	1.5
		Extremely important	98.0
2. Develop treatment plan	4.0	Not important	0.0
		Minimally important	0.5
		Moderately important	4.6
		Extremely important	94.9
3. Implement treatment plan	4.0	Not important	0.5
		Minimally important	0.0
		Moderately important	7.1
		Extremely important	92.4
4. Evaluate treatment	4.0	Not important	0.5
		Minimally important	0.0
		Moderately important	4.6
		Extremely important	94.9
5. Develop discharge plan	3.7	Not important	0.0
		Minimally important	2.5
		Moderately important	22.8
		Extremely important	74.6
6. Organize and manage services	3.3	Not important	0.5
		Minimally important	14.3
		Moderately important	43.9
		Extremely important	41.3
7. Promote professional practice	3.6	Not important	0.5
		Minimally important	3.1
		Moderately important	34.2
		Extremely important	62.2

TABLE 11. Average Amount of Time Spent in Each Domain

Domain	Average Time (%)
1. Assess upper extremity and relevant patient characteristics	18.5
2. Develop treatment plan	11.5
3. Implement treatment plan	33.3
4. Evaluate treatment	14.8
5. Develop discharge plan	8.65
6. Organize and manage services	8.2
7. Promote professional practice	8.3

ADL, function, and dexterity any more than infrequently.

Other tasks rated extremely important were reassessing and documenting patient status, modifying treatment, assessing readiness for discharge and discharge needs, maintaining ethical and legal standards, maintaining a safe work environment, and participating in continuing professional education. Eleven percent of respondents said they engaged in continuing education on an infrequent or rare basis, although they rated it extremely important. In the domain of promoting professional practice, tasks related to participating in education and interpreting relevant research and to participating in activities and associations that advance professional practice were reported as infrequently performed by approximately 40% of respondents. Although professional practice is considered quite important, some respondents do not participate frequently in some work activities associated with this area. This is consistent with the low number of respondents who report that their primary work affiliation is that of an educator or researcher.

All ratings possessed sufficient variance within and between scales to warrant the conclusion that ratings were not the result of any particular response bias set. The respondents did not rate all tasks extremely important and extremely critical. As would be expected, by definition, some tasks may be important to the practice of hand therapy but may be less related to the safety issues tapped by the criticality rating. These distinctions across scales were made. Similarly, candidates made distinctions between ratings of frequency and importance as well.

A content analysis of all open-ended responses was conducted in order to determine whether any domain, task, knowledge, or skill had been omitted or included incorrectly. This analysis indicated that no additions or deletions were needed.

Test Specifications

Final test specifications were derived by equally weighting the times spent and importance ratings for the domains. Task ratings of importance, frequency, and criticality were then equally weighted and multiplicatively combined within domains. These statistical results were combined and compared with additional content-expert ratings of

TABLE 12. Mean Task Ratings for Frequency, Importance and Criticality*

<i>Task</i>	<i>Mean Frequency</i>	<i>Mean Importance</i>	<i>Mean Criticality</i>
1.1 Obtain history and psychosocial conditions	4.7	3.7	2.5
1.2 Interview patient	4.8	3.8	2.4
1.3 Plan and select assessment tools	4.8	3.8	2.5
1.4 Observe and palpate to assess pt. condition	4.8	3.8	2.6
1.5 Assess skeletal, muscular, nervous, vascular, skin connective status	5	4	2.9
1.6 Assess functional status	4.3	3.6	2.2
1.7 Interpret and document the results of the evaluation	5	4	2.6
2.1 Integrate theoretical knowledge bases into treatment	4.6	3.7	2.5
2.2 Establish long-term and short-term goals of treatment	4.6	3.5	2.1
2.3 Establish frequency of treatment with referral source	4	3	1.8
2.4 Analyze treatment techniques available to facilitate achievement of goals	4.8	3.9	2.7
2.5 Consult with and refer to other health care professionals	3.7	3.3	2
2.6 Document the treatment plan	4.8	3.7	2.4
3.1 Implement therapeutic exercise plan	4.8	3.9	2.6
3.2 Treat soft tissue pathology	4.3	3.7	2.4
3.3 Restore and maintain ROM	4.8	3.9	2.5
3.4 Modify edema and its effects	4.5	3.9	2.6
3.5 Modify pain and its effects	4.4	3.8	2.4
3.6 Enhance vascularity	4	3.6	2.5
3.7 Management of wounds and scars	4.3	3.8	2.7
3.8 Fabricate and/or apply orthotic, prosthetic, or assistive devices	4.2	3.8	2.6
3.9 Teach and modify, ADL, function, and dexterity	4.1	3.5	2.3
3.10 Instruct patient and family in treatment program	4.8	3.8	2.6
4.1 Interview patient	4.8	3.8	2.5
4.2 Reassess and document patient status	4.8	3.9	2.5
4.3 Interpret results of evaluation	4.9	3.9	2.6
4.4 Modify treatment	4.9	3.9	2.6
5.1 Assess readiness and determine discharge needs	4.7	3.7	2.3
5.2 Formulate discharge plan	4.4	3.6	2.2
5.3 Educate the patient and family	4.7	3.8	2.6
5.4 Document discharge plan	4.4	3.5	2.1
6.1 Maintain ethical and legal standards	4.9	3.9	2.7
6.2 Maintain a safe environment	4.9	4	2.9
6.3 Develop and maintain systems to ensure quality care	4.5	3.7	2.5
6.4 Assure compliance with organizational policies and procedures	4.5	3.6	2.4
7.1 Participate in continuing professional education	4.3	3.8	2.4
7.2 Participate in education and interpretation of relevant research affecting practice	3.6	3	2
7.3 Participate in activities and associations that advance professional practice and public welfare	3.7	3	1.9
7.4 Ensure ongoing competency in the provision of patient care	4.4	3.8	2.5

*See Table 3 for rating scales.

test weights to derive the final test specifications for the hand therapy certification examination. Table 13 summarizes the final test specifications implemented for the 1995 administration.

COMPARISON OF 1985 AND 1994 SURVEYS

A comparison of demographic characteristics associated with the current sample of CHTs and the 1985 role-delineation sample suggests that there are more similarities than differences. The proportion of hand therapists formally trained as OTs remains significantly greater than that of those formally trained as PTs. In 1985, the percentages of OTs and PTs were 72% and 28%, respectively. In 1994, 88% were OTs and 10% were PTs. Two percent were formally trained in both fields. These data indicate

that there may be 16% fewer PTs practicing as hand therapists. In 1985, the specialty practice of hand therapy was in a more preliminary stage of definition, and therefore the sampling approach was substantially different from the sampling approach used in 1994. In 1985, the survey sample was drawn

TABLE 13. Final Test Specifications

<i>Domain</i>	<i>% of Examination</i>
Assess upper extremity and relevant patient characteristics	23
Develop treatment plan	17
Implement treatment plan	35
Evaluate treatment	13
Develop discharge plan	4
Organize and manage services	3.5
Promote professional practice	4.5

from the following four membership populations: APTA, AOTA, ASHT, and other therapists on the ASHT mailing list. In 1994, only CHTs were sampled. These sampling differences are likely to account for the changes in proportion. Demographic data from hand therapy certification candidates support this. In 1991, 13% of certification candidates were PTs. From 1992 to 1994, the percentages of hand therapy certification candidates who were PTs ranged from 11.1% to 11.9%.

The percentage of survey respondents reporting ASHT membership was 68% in both the 1985 and 1994 survey samples. The average numbers of years respondents reported working were 10.9 in 1985 and 14.5 in 1994. Similarly, in 1994 the average respondent had maintained a caseload of at least 50% upper-extremity patients for 3.3 years longer than in 1985. Although the increase reflected the passage of time, it also reflects the fact that all respondents in the 1994 survey were CHTs certified between 1991 and 1993. Eligibility to sit for the HTCC examination requires at least five years of practice as an OT or PT, so each respondent had to have had a minimum of six years of experience by the time of the 1994 survey.

The 1994 survey highlights interesting changes in the practice settings of hand therapists compared with the traditional practice settings of survey respondents in 1985. There has been a definite shift away from hospital-based facilities (51% in 1985 compared with 43% in 1994) and from those that are physician owned (19% in 1985 compared with 13% in 1994). There may also be a trend toward a decrease in therapist-owned facilities (28% in 1985 compared with 25% in 1994). Survey respondents in 1994 identified two categories of practice settings that were not widely seen in 1985. Thirteen percent reported working in corporate-owned facilities, and 3% were working for health maintenance organizations (HMOs). Legislation restricting the provision of hand therapy in physician-owned practices, and market conditions brought on by managed care may lead to further changes in practice setting.

There is comparability between the types of diagnoses made by hand therapists in 1985 and the diagnoses made in 1994. Although different rating scales were used, it is possible to discern trends. The most frequently cited diagnostic categories across the two studies are fracture/dislocations, cumulative trauma disorders, soft-tissue disorders, and tendon disorders. The least frequently encountered diagnoses have also remained the same: congenital anomalies, tumors, and thermal injuries. Multiple-system traumas apparently were seen less frequently in 1994 than in 1985. This could be due to a variety of trends: fewer hand therapists working in hospital-based settings, where the more severe injuries are often seen; a decrease in heavy industry in the United States, which is where many of the most severe injuries often occur; and the proliferation of injury-prevention measures brought about by regulations enforcing equipment and workplace safety and training.

The organization of the 1994 survey differs sig-

nificantly from the one done in 1985; however, where the content areas are similar, the responses are quite comparable. Most of a hand therapist's time continues to be spent in areas associated with direct patient care, whereas activities related to teaching, management, research, and the promotion of hand therapy practice are done less frequently. Survey respondents in 1994, like those in 1985, reported that even though they spent less time performing these activities, they considered them to be moderately to extremely important in the practice of hand therapy.

DISCUSSION

Significance of the Change in Practice Analysis Approach

The initial definition of hand therapy practice delineated by the HTCC Practice Analysis Task Force was accurate and comprehensive. This was evidenced in a number of ways by the results of the validation survey.

First, at the domain level, four of the seven content domains had average importance ratings of 4. This was the highest rating possible and indicated that these four domains were extremely important. These content areas addressed the following: assessing upper-extremity disorders and relevant patient characteristics, developing a treatment plan, implementing the treatment plan, and evaluating treatment. The remaining three content domains received average importance ratings of greater-than-moderate importance and addressed the following: developing a discharge plan, organizing and managing services, and promoting professional practice.

Second, support for the practice analysis is found in the importance, frequency, and criticality ratings of each of the 39 behavioral tasks subsumed by the 7 content domains. All task statements were rated well above minimally acceptable levels. This means that all identified work behaviors were of moderate or greater importance, were performed frequently or extremely frequently by incumbent hand therapists, and were necessary or critical to patient safety.

Finally, the results of the open-ended portion of the validation survey provided support for the new practice analysis. Survey respondents were specifically asked to cite content areas that had been omitted from the practice analysis document, as well as to indicate where extraneous material had been included inaccurately. The open-ended responses provided conclusive evidence that no omissions or extraneous inclusions were present in the scope of practice of hand therapy.

This strong support for the new practice analysis is important for several reasons. The 1994 results describe the practice of hand therapy using a more comprehensive structural model than that used in 1985. In 1985, the role delineation was content-based and described hand therapy by focusing

on descriptors such as wounds and scars, edema, ROM, and prosthetics. At that time, six knowledge areas were identified: anatomy, histology, physiology, kinesiology, physics, and surgery. In 1994, both the content and the processes associated with hand therapy were captured, and 53 knowledge and skill statements were delineated. Additionally, a three-tiered typology was adopted in which domains of responsibility, behavioral tasks, and knowledge and skills were systematically used to describe the practice of hand therapy. This typology introduced a balanced descriptive structure by using three inter-related levels of analysis that were not present in the 1985 role delineation.

The 1994 model enables HTCC to improve its certification program by focusing on the entire treatment process and patient picture, as well as by examining the profession as an evolving discipline. Rather than looking at discrete symptoms or specific therapeutic techniques in isolation, the therapist can address the whole patient by using the process component of the model. While the new model has not significantly altered the general, guiding definition of hand therapy practice, it has enabled a more sophisticated and complex approach to delineating test specifications and developing test items.

The practice analysis results have expanded the definition of the hand therapy profession by including new domains involving discharge planning, ongoing treatment assessment, the organization and management of the provision of services, and the promotion of professional practice and continuing education. Data from the validation survey strongly supported the importance of these areas to competent hand therapy practice. These results help to enhance the certification program by emphasizing the need to keep abreast of new developments in the field that foster effective practice. These results provide additional focus areas for test specifications and item development both at the initial certification level and the point of recertification. In addition to identifying the importance of recertification and continuing education to maintaining competent practice, the practice-analysis data provide specific direction regarding how these areas should be assessed.

SUMMARY AND CONCLUSION

Just as the definition of hand therapy has become more complex since 1985, so have the profession and the environment in which it is practiced. Changes in the health care arena brought about by managed care are influencing practice patterns and will likely alter the role the hand therapist plays in the future. Future practice analyses will probably find 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. Historically, the hand therapist has experienced much

autonomy in the delivery of hand therapy, as evidenced by the high percentage of respondents who reported that they consult with other health care professionals only on an infrequent or rare basis. It is likely that the role the hand therapist plays in case management will expand and that there will be more time spent in collaborating with others regarding the patient. It is also anticipated that more of the actual treatment of patients will be provided by aides and assistants working under the direct supervision of the CHT and that, therefore, interaction with other health care professionals will increase.

Changes in hand therapy reimbursement structures and incentives are also influencing practice patterns. Increased resource and utilization management under managed care is resulting in fewer therapy sessions per patient in many parts of the country. There also appears to be a trend toward defining the success of hand therapy interventions by the patient's functional ability rather than his or her physical impairment or disability. Respondents to the 1985 and 1994 surveys reported spending very little time teaching or modifying ADL, function, and dexterity compared with the amount of time spent addressing the physical needs of their patients. It will be interesting to see if these proportions change in the future.

Several respondents in the 1985 and 1994 surveys indicated that they neither perform research nor are trained in research design. It is possible that this could have negative implications for the hand therapy profession and on the individual CHT's ability to compete for patients and shrinking reimbursement. Hand therapists, like other health care professionals, are being held accountable for proving that the services they provide are directly responsible for patient improvement. The need to standardize hand therapy interventions and to predict, measure, and report patient outcomes will most likely lead many hand therapists toward actions designed to increase their understanding and skill in research techniques.

Taken together, the support for the practice analysis, the adoption of a comprehensive content and process model, and the addition of content domains that include the entire continuum of hand therapy intervention have substantially enhanced the definition of the profession and its ability to accurately assess competence through its certification program.

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