

A Role Delineation Study of Hand Therapy

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ABSTRACT: In 1985 the American Society of Hand Therapists (ASHT) conducted a role delineation study (occupational analysis) of hand therapy. ASHT distributed a questionnaire to 1046 therapists, 49% of whom responded. The respondents provided information about themselves and their practices; rated a variety of professional activities and concepts on frequency of occurrence and degree of importance in practice; stated where they had learned these activities and concepts as well as where they thought they should be learned; and expressed opinions about issues related to the certification of hand therapists. The study revealed a core set of important and frequently performed activities. The data from this occupational analysis can serve to define the practice of hand therapy, to identify educational objectives, 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.

INTRODUCTION

The specialty of hand therapy has emerged from the professions of occupational therapy (OT) and physical therapy (PT) as a response to advances in surgical techniques that enable greater functional restoration of injured and diseased upper extremities. As hand therapy evolved, there were few established educational or professional standards representing the body of knowledge central to the practice of hand rehabilitation. Initially, individual therapists practiced similar activities without the benefit of a professional framework or organization. The philosophical ideals of the practice were not conceptualized until a small group of occupational and physical therapists came together in 1975 to share their knowledge and experience. From this meeting, the American Society of Hand Therapists (ASHT) was established for the purpose of becoming a recognized society with the goal of promoting standards of practice, research, continuing education, and publications in rehabilitation of the upper extremity.

The term hand therapy refers to a specialized service that developed to fulfill a need for comprehensive management of upper extremity dysfunction. The demand for qualified hand therapists by physicians, employers, and consumers has resulted in more practitioners offering this service. As a result, standards for the provision and quality of care must

be established to ensure competence and to protect the public welfare. Although ASHT has been a leader in the professional development of hand therapy, it has not been in a position to establish official standards, because the practice of hand therapy has never been formally defined, nor have the requisite knowledge and skills been established. Thus, membership in the Society alone cannot be viewed as an attestation of professional competence.

In 1985 ASHT took the first step toward establishing the standards of hand therapy practice by conducting an empirical study to delineate the role of a hand therapist. Such an occupational analysis or role delineation can serve 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 purpose of this article is to summarize and discuss the results of the role delineation study of hand therapy.

METHOD

The role delineation study of hand therapy was designed by the Certification Committee of the American Society of Hand Therapists in consultation with The American College Testing Program. The Certification Committee included six ASHT members who represented both occupational and physical therapy and who had academic, clinical, or administrative expertise. The committee's tasks were to select the target populations of the study and to determine the content

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of the survey. The study, which was designed to survey occupational and physical therapists in the United States who were likely to be performing hand rehabilitation, included four populations: (1) members of the American Physical Therapy Association (APTA) Special Section on Hands; (2) members of the American Occupational Therapy Association (AOTA) Physical Disability Special Interest Section who had reported that they worked primarily in hand therapy; (3) ASHT members; and (4) other therapists who subscribe to ASHT's supplemental mailing list. The committee requested a random sample of 300 names from each of the first two groups and received 310 names from APTA and 299 from AOTA. The study attempted to survey the latter two groups in their entirety. A total sample of 1046 therapists was drawn from the four populations.

A self-report questionnaire divided into four sections was selected as the instrument of the study. The first section was designed to collect information about the demographic characteristics of the therapists, which included professional affiliations, presence of a physical disability, gender, geographical state of practice, educational background, number of years spent in professional practice, number of years devoted to hand therapy practice, and racial or ethnic background. Additionally, to investigate the nature of the respondents' professional practices the survey asked how often the therapists encountered 13 common diagnoses in their practices, how many hours per week they spent working in each of seven practice settings, and the number of hours per week spent on patient care, teaching, research, and administration.

The second section asked therapists about the role of activities, skills, and modalities (ASMs) in hand therapy practice. Drawing on the available literature and the collective knowledge of its members, the committee categorized 91 of the most commonly performed ASMs, which were then evaluated on four dimensions.

A. Frequency Dimension

Typically, how often do you perform this activity?

1. Several times a day
2. Once a day
3. Once a week
4. Once a month or less
5. Do not perform this activity

B. Importance Dimension

To what extent is practical knowledge/skill in this activity important for hand therapy practice?

1. Very important
2. Important
3. Somewhat important
4. Not important
5. Do not know

C. Education Dimension

Where did you acquire the practical knowledge/skill needed to perform this activity?

1. Formal OT or PT education
2. On-the-job training
3. Continuing education
4. Graduate school
5. Independent study
6. Did not learn

D. Learning Dimension

If this activity was not taught in formal OT or PT education, what would be the best method to teach it?

1. Should be taught in formal OT/PT education only
2. On-the-job training
3. Continuing education
4. Graduate school
5. Independent study

Although the dimensions serve distinct purposes, the four are not unrelated. The frequency dimension describes how often an activity is performed, yet frequency must be viewed in relation to importance. For example, in a hand therapy practice, active range of motion may be a daily activity of great importance. On the other hand, management of open wounds may be done infrequently but remains a critical activity that must be performed correctly for patient welfare. The primary purpose of the education dimension is to differentiate entry-level physical or occupational therapy skills from advanced-level skills. In contrast to the education dimension, which assesses actual educational experiences among therapists, the purpose of the learning dimension is to determine what methods can or should be used to teach these ASMs.

The third section of the survey requested information on six major categories of theory and knowledge fundamental to hand therapy practice: anatomy, histology, physiology, kinesiology, physics, and procedures of hand surgery. Like the second section, the third section rates each topic along the four dimensions of frequency, importance, education, and learning. The wording of the questions in this section was designed to determine the integration of theory and knowledge into practice.

A. Frequency Dimension

How frequently do you integrate and apply this knowledge in the clinical setting?

1. Several times a day
2. Once daily
3. Once a week
4. Once a month or less
5. Do not use this knowledge

B. Importance Dimension

To what extent is mastery of this topic important to hand therapy practice?

1. Very important
2. Important
3. Somewhat important
4. Not important

C. Education Dimension

How did you acquire the information needed to apply this theory/knowledge in the practice of hand therapy?

1. Formal OT or PT education
2. On-the-job training
3. Continuing education
4. Graduate school
5. Independent study
6. Did not learn

D. Learning Dimension

If this topic was not taught in a formal OT or PT program, what would be the best method used to teach it?

1. Should be taught in a formal OT or PT program
2. On-the-job training
3. Continuing education
4. Graduate school
5. Independent study

The first three sections of the survey were designed to generate the data base for the role delineation analysis. The fourth section was an adjunct that requested therapists' opinions regarding the necessity, potential consequences, and mechanics of a formal certification program for hand therapy. Prior to the survey of the selected sample, the survey form was field-tested. Each member of the certification committee administered the survey to three colleagues. The respondents' comments regarding question ambiguity and their tendencies to answer in response sets were evaluated. The questionnaire was revised and the field test repeated with a new group of reviewers. The final survey form incorporated revisions made in response to the second field test.

RESULTS

Of the total sample of 1046 therapists, 513 returned their surveys, for an overall response rate of 49%. The response rate of the APTA Special Section on Hands sample was 20%; the AOTA Physical Disability Special Interest Section 30%; ASHT 68%; and ASHT mailing list subscribers 66%. Of the 513 respondents, 72% identified themselves in the survey as occupational therapists and 28% as physical therapists. Forty percent said they are members of ASHT; 48% reported membership in the AOTA Physical Disability Special Interest Section; and 24% said they are affiliated with the APTA Special Section on Hands.

In the presentation of the results of the role delineation survey, the sample can be divided into many subgroups, e.g., occupational therapists, physical therapists, ASHT members, therapists working in different work settings, therapists working in different geographical regions—however, the selection of groups for comparison depends on the information desired. Since the main purpose of the study is to identify the characteristics of hand therapy by looking at the actual practice of hand rehabilitation in the United States, the summary of results and the ensuing discussion will highlight points of interest not only for the total group but for the subgroups of ASHT members and nonmembers. This has been done because initial review of the data revealed differences in the characteristics of therapy performed by ASHT members and nonmembers. An explanation for these differences may be that the ASHT group has met criteria for membership in the Society by having practical experience. In contrast, responses regarding actual work activities that occur within the nonmember groups do not necessarily reflect hand therapy practice.

Responses to the demographic section of the survey are selectively summarized under three major headings: (1) educational background and on-the-job experience in therapy; (2) characteristics of current practice; and (3) patterns in clinical practice. Responses to the questions on education indicate that 75% of the respondents hold a bachelor's degree; 23% a master's degree; and 1% a PhD or EdD. At the baccalaureate level, 72% hold degrees in OT or PT. At the master's level, 18% had studied in OT or PT pro-

TABLE 1. Frequency of Employment in Different Types of Hand Therapy Practice.

	TOTAL GROUP		ASHT MEMBERS		ASHT NON-MEMBERS	
	Frequency	%	Frequency	%	Frequency	%
Therapist-owned						
private hand center	144	28	73	36	71	23
Physician-owned						
private hand center	96	19	56	28	40	13
Hospital hand center	96	19	48	24	48	15.5
General hospital	143	28	34	17	109	35
Rehabilitation hospital	23	4.5	7	3	16	5
Classroom teaching	33	6	21	10	12	4
Research	25	5	18	9	7	2

grams. One individual reported holding a doctoral degree from a therapy program. Regarding on-the-job experience, the mean number of years respondents reported working as therapists was 10.9 for the total sample. Considered as a separate group, ASHT members averaged 11.4 years on the job while nonmembers averaged 10.5. The average number of years respondents reported specializing in hand therapy was 6.5 for the total sample. ASHT members averaged 7.7 years of hand therapy specialization whereas nonmembers averaged 5.6.

To ascertain the characteristics of current practice, respondents were asked about their employment in therapist-owned private hand centers, physician-owned private hand centers, hospital hand centers, general hospitals, rehabilitation hospitals, classroom teaching, and research. Table 1 lists the frequency and percentage of responses for each setting for the total sample, ASHT members, and nonmembers. A greater proportion of ASHT members than nonmem-

TABLE 2. Average Rating of Frequency of Diagnoses Encountered in Current Hand Therapy Practice.*

DIAGNOSIS	AVERAGE RATING TOTAL GROUP
Fractures/dislocations	3.9
Tendon disorders	3.8
Cumulative trauma disorders/ inflammatory responses	3.7
Soft tissue disorders	3.7
Peripheral nerve dysfunction	3.5
Multiple system trauma	3.5
Rheumatic disease	3.4
Amputations	3.2
Infections	3.2
Thermal injuries	2.7
Myofascial pain	2.6
Tumors	2.3
Congenital anomalies	2.2

* Respondents rated frequency of diagnoses as follows: (1) never, (2) seldom, (3) occasionally, (4) frequently, and (5) exclusively.

TABLE 3. Activities, Skills, and Modalities of Hand Therapy Evaluated in Four Dimensions.

TOPIC	FREQUENCY	IMPOR-			TANCE	EDUCA-			TION			
		%T	%M	%N		%T	%M	%N		%T	%M	%N
1. Topographical Evaluation (deformities, skin, color, etc.)	Several/day	68	79	61	Very	67	75	62	On-the-job	55	66	48
2. Wound Management												
Whirlpool, debridement, dressing	Several/day	39	49.5	32	Very	63	70	58.5	On-the-job	67	74	63
High voltage galvanic stimulation, interferential current	Do not perform	63	68	60	Important	25.5	20*	29	Didn't learn	44	47.5	41
Fluidotherapy	Do not perform	69	60	75	Somewhat	34	33	35	On-the-job	36	45	30*
3a. Scar Management for Hypertrophy												
Pressure techniques (i.e., otoplasty, Silastic, garments)	Several/day	29	39.5	21 ^c	Very	70	79	64	On-the-job	47	50	45
Splinting	Several/day	47	62	37	Very	82	87.5	78	On-the-job	40.5	42	39
Vibration/massage	Several/day	64	79	53	Very	65	72	60	On-the-job	49.5	53.5	47
3b. Scar Management for Adhesions												
Heat	Several/day	54	63	48	Very	52	58	48	On-the-job	44.5	47	43
Ultrasound	Do not perform	53.5	60	49	Very	38	34	40	Didn't learn	32.5	35	31
Vibration/massage	Several/day	69	79	63	Very	66	70.5	63	On-the-job	52.5	57	49.5
Splinting	Several/day	50	69	37	Very	79	84	75	On-the-job	40	45	37
CPM	Do not perform	55	42	63	Somewhat	32	38	28	On-the-job	33	38	30.5
Galvanic/faradic stimulation	Do not perform	58	60.5	56	Don't know	26	28	24.5	Didn't learn	42	43	41
4a. Evaluation of Edema	Several/day	67	79	59	Very	83	88	81	On-the-job	45.5	47	45
4b. Edema Control Techniques												
Compression garments (Jobst, Isotoner)	Several/day	28	39	21	Very	69	76	64.5	On-the-job	50	49.5	51
Mechanical compression (pump, splint)	Once a month	28	25	30	Very	51	54	49	On-the-job	54	58	51
Manual compression (Coban, retrograde massage)	Several/day	60	78	48	Very	74	85	66	On-the-job	56	64	51
CPM	Do not perform	60	50	66.5	Somewhat	30	35	26	On-the-job	33	37	31 ^f
Contrast bath, ice	Once a month	26	23	27	Very	36	40	34*	On-the-job	42	45	40
Elevation, AROM	Several/day	82	89	78	Very	87	93	83	Formal	63	60	65
Galvanic/faradic stimulation	Do not perform	61	65	58	Don't know	29	32	27	Didn't learn	41	42	40
5a. Evaluation of Pain	Several/day	75	77	73	Very	78	80	77	On-the-job	48	49	48
5b. Pain Control Techniques	Several/day	73	82	67	Very	88	89	88	On-the-job	42	45	39.5
6. Vascularity Assessment	Several/day	27	31	24	Very	54	53	55	On-the-job	47	53	43
7a. Evaluation of Sensibility	Several/day	35.5	41	32	Very	80	86	76	Formal	35	24.5 ^b	42
7b. Sensory Reeducation	Once a week	25	24 ⁱ	26	Very	58	65	54	On-the-job	34	41	30 ⁱ
8a. Evaluation of Range of Motion												
Active range of motion	Several/day	89	95.5	85	Very	93	96.5	90	Formal	89	90	88
Passive range of motion	Several/day	84	89	80	Very	90	95	87	Formal	88	89	87
Torque measurements	Do not perform	60.5	62	59	Don't know	38	43	35	Didn't learn	48	50	47
Passive assessment (i.e., accessory movements, joint play, intrinsic tightness)	Several/day	63	72	57	Very	77	83	72	Cont ed	34	42	29
Total active motion (TAM) Total passive motion (TPM)	Several/day	40.5	46	37	Very	49	55	45	Cont ed	39	44	35
8b. Treatment for Range of Motion												
Passive range of motion	Several/day	85	87	84	Very	90	91.5	89	Formal	78.5	77	79
Active range of motion	Several/day	93	96	90	Very	94	95	93	Formal	82.5	82	83
Active assistive range of motion	Several/day	88	92	85	Very	91	93	90	Formal	76.5	71	80
Resistive exercise/activity	Several/day	87	93	83	Very	89.5	91	89	Formal	76	75.5	76.5
CPM device	Do not perform	55	41	64	Somewhat	32	34	31	Cont ed	31	35	28*
Splints	Several/day	57	78	43	Very	86	93	82	Formal	43	43.5	42
Strengthening equipment	Several/day	76	85	70	Very	78	81	76	Formal	50	50	50
9a. Evaluation of Strength												
Grip/pinch strength (dynamometer)	Several/day	70.5	83.5	62	Very	85	89	82	Formal	65	67	64
Manual muscle test	Several/day	35	35	35	Very	75	80	72	Formal	88	90	86
Endurance	Several/day	34	36	33	Very	59.5	62	58	Formal	45.5	44	47
Nerve conduction/EMG	Do not perform	94	95	93.5	Very	25	20 ⁱ	28.5	Didn't learn	72	76	69.5
9b. Strengthening Techniques												
Resistive exercise	Several/day	85	90.5	81	Very	85	88	83	Formal	71	69.5	72
Resistive activities	Several/day	73	79	69	Very	82	84	80.5	Formal	66	65	67
10a. Evaluation of Dexterity	Once a week	28	29	27 ⁿ	Very	45	49	42	On-the-job	41	45	38
10b. Treatment of Dexterity	Several/day	69	74	65	Very	78	79	77	Formal	58	61	56
11. Prosthetic Evaluation and Training	Do not perform	55	42 ^o	63.5	Important	35	40.5	32	Formal	35	44	29 ^o
12. Orthotic Fabrication and Training												
Custom	Several/day	46	65	34	Very	74	82	69	On-the-job	38	42	36
Commercial	Do not perform	26	18*	32	Very	48	56	43	On-the-job	53.5	55	52
Casting	Do not perform	38	25 ^r	46.5	Very	37.5	42	35	On-the-job	44	51	39
Custom adaptive equipment	Once a month	37	40	35.5	Very	48	54	44	On-the-job	44	44	44
13a. Work Evaluation	Do not perform	31	18*	39	Very	48	56	43	Cont ed	42	49	37
13b. Work Conditioning	Several/day	28	38	22	Very	54	64	47	Cont ed	39	45	34

TABLE 3. (Continued.)

<i>LEARNING</i>	<i>%T</i>	<i>%M</i>	<i>%N</i>
On-the-job	43.5	51	39
On-the-job	49	52	47
Formal	48	50	47
On-the-job	41	41	41
Cont ed	34.5	30 ^d	38
Formal	41	44	40
On-the-job	37	37	37.5
Formal	50	53	48
Formal	56	60	53
Formal	42	42.5	42
Formal	45	46	44
Cont ed	41	42	41
Formal	52	56.5	49
Formal	48	49	47
Formal	36	36.5 ^r	35
Formal	40.5	39	41
On-the-job	39	39	39
Cont ed	43	48	40
Formal	45	45	45
Formal	54	51	55
Formal	53	51	54
Formal	38	36	39
Cont ed	41	42	40
Formal	37	33	40
Formal	45	44	45
Cont ed	45	47	44
Formal	74	75	74
Formal	74.5	75	74
Formal	44	40	46
Formal	47	44	49.5
Formal	49	54	46.5
Formal	71	72	70
Formal	71	73	69
Formal	70	72	68
Formal	68	70	66
Cont ed	41	45.5	38
Formal	53	55.5	51
Formal	52	55	50
Formal	65	67	64
Formal	76	73	78
Formal	56	56	56
Formal	32	28 ^m	35
Formal	62	63	62
Formal	58	59	57
Formal	43	50	39
Formal	53	56	51
Cont ed	46.5	47	46
Formal	40	45	36
On-the-job	37	34	38
Cont ed	36	37	36
Formal	37	41	34
Cont ed	59	64	56
Cont ed	58	63	54

bers reported working in hand centers, while a greater proportion of nonmembers than members reported working in hospitals. Few respondents reported being responsible for classroom teaching or research assignments. The second section of the survey provides supplementary information on the role of teaching, research, and administration in hand therapy practice. Although more than half (56%) of the respondents reported that they teach once a month or less, 41% rated teaching a very important activity. Fifty-six percent of the respondents said they do not perform research, with 24% saying they had not learned research skills. Nevertheless, 76% judged research an important or very important activity. Administrative responsibilities were ranked as very important by 45.5% of the respondents, and 33% said they carry out administrative tasks several times a day.

To assess the patterns of practice in hand therapy, data were collected on the frequency with which therapists handle 13 common diagnoses of the upper extremity. For each diagnosis, respondents selected one of five frequency ratings, which are listed in Table 2. The table provides the average response values in descending order. According to the survey, the most frequently encountered diagnoses in hand therapy are fractures and dislocations; the least frequently encountered are congenital anomalies. Relatively large percentages of "never" responses occurred among the three diagnoses with the lowest average ratings: 20.5% of the respondents said they had never encountered myofascial pain; 14% had never seen tumors; and 17% had never treated congenital anomalies. Reports of a practice devoted exclusively to the treatment of a single diagnostic category were rare.

Table 3 abstracts the results of the second section of the survey dealing with specific activities, skills, and modalities of treatment and their four dimensions of frequency, importance, education, and learning.* Under each dimension, the table provides the category most frequently selected by the total sample of respondents and the percentage of respondents in the total sample (%T) selecting this category. The table also lists the percentage of ASHT members (%M) and the percentage of nonmembers (%N) selecting this same category. For example, Table 3 shows that for the total sample, topographical evaluation is performed several times a day by 68% of the respondents, is considered very important by 67%, was learned on-the-job by 55%, and is considered by 43.5% to be a subject best learned on the job if it is not learned in a formal OT or PT program. Using the same format as Table 3, Table 4 summarizes the results of the third section of the survey concerning theory and knowledge. For example, Table 4 shows that for the total sample, knowledge of anatomy of the upper extremity is applied several times a day in practice by 86% of the respondents, is considered important by 96%, was learned in a formal OT or PT program by 47%, and is considered by 58% to be a subject best learned

* Although the second section of the survey collected information about therapists' involvement with teaching, research, and administration, Table 3 does not include response data on these activities.

TABLE 3. Activities, Skills, and Modalities of Hand Therapy Evaluated in Four Dimensions (Continued).

TOPIC	FREQUENCY	%T	%M	%N	IMPOR- TANCE	EDUCA- TION			%T	%M	%N	
						%T	%M	%N				
14. Therapeutic Heat and Cold												
Ultrasound (phonophoresis, mechanical)	Do not perform	54	62	48.5	Very	41	39	43	Didn't learn	34	40	31 ^a
Hot pack, paraffin	Several/day	55	61	52	Very	55	59	52.5	On-the-job	46	48	45
Fluidotherapy	Do not perform	67	59	72	Somewhat	27	32	24	On-the-job	35	37	33
Cold pack, ice, massage, contrast baths	Several/day	44	47	42	Very	54	54	54	On-the-job	43	48	40
Fluoromethane spray	Do not perform	70	72	68.5	Don't know	32	32	32	Didn't learn	44	44	45
Whirlpool	Several/day	31.5	33	30	Very	48	49	47	On-the-job	46	49	45
15. Manual Therapy												
Joint mobilization	Several/day	58	61	56	Very	71	66	74	Cont ed	54	64	47
Soft tissue techniques (stretch, friction massage, knuckling, contract/relax)	Several/day	72	76	69	Very	77	73	79	On-the-job	39	42	37.5
Stretch and spray techniques	Do not perform	66	68	65	Don't know	32	34	30	Didn't learn	45	46	44
Trigger point techniques (ultrasound, pressure massage, TENS, faradic/galvanic stimulation)	Do not perform	30	28	31	Very	44	39	47	Cont ed	28	35	24.5 ^a
16. Electrophysiological Techniques												
Laser	Do not perform	97.5	97	98	Don't know	65	66	65	Didn't learn	82	87	79
TENS	Do not perform	27	17 ^b	33	Important	36	34 ^c	38	On-the-job	35	39	32
Temperature biofeedback	Do not perform	75	67	81	Don't know	30	26	33	Didn't learn	43	38.5	46.5
Iontophoresis	Do not perform	81	83	79.5	Don't know	41	40	42	Didn't learn	56	58	55
Phonophoresis	Do not perform	70	74	67	Don't know	39	39	38	Didn't learn	53	57	51
Interferential current	Do not perform	85	91	80	Don't know	52	58	48	Didn't learn	65.5	74	60
Faradic/galvanic stimulation (bone or muscle stimulation)	Do not perform	57	62	53	Don't know	30	34	27	Didn't learn	42	48	38
Acuscope/Alpha Stimulation 5000	Do not perform	94.5	98	92	Don't know	63	65	62	Didn't learn	80	84	76
17. Neuromuscular Techniques												
Relaxation techniques	Several/day	26.5	29	24.5	Very	42.5	38	45	Formal	46.5	44	48
PNF	Once a month	24	24	23	Important	30	31	29.5	Formal	61	60	61
Muscle reeducation	Several/day	32	34.5	30	Very	59	60	59	Formal	57	59	56
EMG biofeedback	Do not perform	58	51	62	Somewhat	31	33	29	Didn't learn	30	28	32
Vibration/icing	Do not perform	23	24	23	Important	34	29	38	Formal	43	37	47
Faradic/galvanic stimulation	Do not perform	51	55	49	Very	28.5	26	30	Didn't learn	34	37	33
Splinting	Several/day	41	53	33	Very	66	67	65	Formal	41	42	41

^a More ASHT members (27%) selected Very important.

^b More nonmembers (35%) selected Did not learn.

^c More nonmembers (28%) selected Once a month or less.

^d More ASHT members (37%) selected Formal OT or PT education.

^e More ASHT members (36%) selected On-the-job training.

^f More nonmembers (34%) selected Did not learn.

^g More nonmembers (36%) selected Important.

^h More ASHT members (35%) selected On-the-job training.

ⁱ More ASHT members (27%) selected Several times a day.

^j More nonmembers (31%) selected Continuing education.

^k More nonmembers (29%) selected On-the-job training.

^l More ASHT members (27%) selected Do not perform this activity.

^m More ASHT members (31%) selected Continuing education.

ⁿ More nonmembers (30.5%) selected Do not perform this activity.

^o More ASHT members (53%) selected Once a month or less.

^p More nonmembers (32%) selected Did not learn.

on the job if it is not learned in a formal OT or PT program.

Table 5 gives the results for the fourth section of the survey, which asked respondents' opinions about the desirability of certification, its effects on the profession and individual practice, the format and cost of a certification program, and the appropriateness of hand therapy practice without physician referral. The majority (55%) of respondents favor certification, with a higher percentage of ASHT members (70%) than nonmembers (44%) favoring certification. Generally, respondents said certification would have a positive effect on the profession by improving patient care, improving standards of practice, and increasing prestige. On the other hand, many said certification might have the effect of limiting therapists from practicing. Respondents frequently said the personal effects of certification would be to increase prestige, improve standards of practice, and improve hand therapy skills in their own practices. Most respon-

dents favor a written examination that would cost between \$50 and \$100 to be paid by the candidate. Most (75%) said hand therapy practice without physician referral is inappropriate.

DISCUSSION

The role delineation study of hand therapy was undertaken to provide a systematic description of what hand therapists do, to determine what they should be held responsible for, and to assess new directions in the field. The current study is one of many role delineation studies¹⁻⁴ that have been conducted in the health professions for such purposes as assessment of manpower needs and the development of testing programs in licensure and certification. Although it is possible to utilize a variety of research methods in occupational analyses, the most commonly selected and practical techniques involve the self-report. The results of studies utilizing self-reporting techniques

TABLE 3. (Continued.)

<i>LEARNING</i>	<i>%T</i>	<i>%M</i>	<i>%N</i>
Formal	62.5	59	65
Formal	54	51	56
Formal	39	33.5	42
Formal	52	49	54
Formal	41	31.5 ^a	47.5
Formal	52	49	54
Cont ed	47	56	41
Formal	43	39	45
Cont ed	41	49	36
Cont ed	42	50	36
Cont ed	42	47	39
Formal	46	43.5	48
Cont ed	41.5	44.5	39.5
Formal	50	47	51
Formal	50	47	52
Formal	48	47	49
Formal	51	45	54.5
Cont ed	41.5	42.5	41
Formal	50	50.5	49
Formal	60	59	61
Formal	57	57	58
Cont ed	41	46	38
Formal	52	48	54.5
Formal	55	54	56
Formal	48	48	48

^a More ASHT members (28%) selected Several times a day.
^b More ASHT members (29%) selected Once a month or less.
^c More ASHT members (23.5%) selected Once a week.
^d More nonmembers (39%) selected Formal OT or PT education.
^e More ASHT members (38%) selected Continuing education.
^f More nonmembers (30%) selected On-the-job training.
^g More ASHT members (28%) selected Once a month or less.
^h More ASHT members (39%) selected Very important.

such as the mail questionnaire should be interpreted critically, since responses may not be wholly reliable and the sample that chooses to respond to the survey may not be wholly representative of the target populations of the study. Despite its methodological limitations, the current study nevertheless has provided a wealth of descriptive information about the practice of hand therapy. The discussion to follow focuses on the heart of the survey, namely, the patterns of response to questions about activities, skills, and modalities, and the theory and knowledge of hand therapy practice.

Activities, Skills, and Modalities (ASMs).

Table 3 shows that all of the ASMs the respondents perform several times a day are rated very important or important. Almost all respondents reported that evaluation and treatment of passive and active range of motion, and evaluation and treatment of strength are performed several times a day, are very important, and are learned as part of basic, formal education.

Therefore, these are likely to be core activities for most therapists.

Responses in the frequency dimension show that most of the ASMs—particularly the evaluation of edema, the use of manual compression for edema control, topographical inspections, and the use of orthotics—are performed more often by ASHT members than nonmembers. This higher frequency may reflect a higher concentration of patients with hand injuries seen by ASHT members who reported working in specialized hand therapy settings.

Many ASMs are learned in formal education, but on-the-job training is also important for learning some skills, especially topographical evaluation, whirlpool, debridement and dressing of wounds, vibration, massage, and manual compression. Topographical evaluation and wound care may require actual viewing of hand wounds not adequately represented in two-dimensional pictures or realistically simulated in a classroom setting. Mastering techniques such as vibration, massage, and manual compression may require practical application or be learned more easily through demonstration and discussion with a colleague in the clinical setting. Newer techniques, such as joint mobilization and work evaluation, are most frequently learned in continuing education, possibly because the techniques were developed after many of the respondents completed their formal education.

The therapists said most ASMs, including all but six of the 32 ASMs they reported learning on the job, are more appropriately taught during formal or continuing education. While on-the-job training may provide a refinement of skills that leads to an advanced level of knowledge, many therapists reported a desire for more formalized instruction either in basic or continuing education. This may reflect a desire to achieve greater understanding of these activities early in their careers or prior to clinical exposure.

Many of the respondents reported that they do not perform a variety of ASMs, many of which are related to therapeutic advances, specialized equipment, or specialized settings. Many more experienced therapists may not use new techniques, such as torque range of motion, joint mobilization, and CPM, which may not have been taught in formal OT or PT education until recently. Other modalities, such as electrophysiological techniques, may require the use of newer specialized equipment, such as Acuscope and laser, which many therapists may not be trained to use or able to afford to use. Other ASMs that a majority of the respondents do not perform require the use of specialized equipment, such as fluidotherapy, that is not available in many settings. Activities such as prosthetic evaluation and training, and work evaluation would not be reported by therapists who do not work in the specialized settings in which these activities are typically performed. Finally, such ASMs as electrophysiological techniques, which are traditionally techniques of physical therapy, may not be performed by many occupational therapists represented in the survey sample.

With few exceptions, the ASMs were rated as very important or important. Several ASMs, such as

TABLE 4. Theory/Knowledge of Hand Therapy Evaluated on Four Dimensions.

TOPIC	FREQUENCY	IMPOR-			IMPOR-	EDUCA-			EDUCA-	EDUCA-		
		%T	%M	%N		TANCE	%T	%M		%N	TION	%T
1. Comprehensive understanding of the anatomical relationship in the upper extremity and how relationship is altered by pathology.	Several/day	86	92.5	81	Very	96	98	95	Formal	47	36	54
2. Applied Histology												
Tissue healing (skin, nerve, tendon, bone)	Several/day	76	87	68	Very	91	92	90	Cont ed	29	39.5	21.5 ^a
Effects of immobilization on connective tissue	Several/day	75.5	85.5	69	Very	91	91	90	Cont ed	29	40	22
3. Physiology of the Upper Extremity												
Muscle physiology	Several/day	65	69	62	Very	82.5	82	83	Formal	68	61	72
Sensory physiology (including pain)	Several/day	63	68	59	Very	83.5	86	82	Formal	57	45	65
Vascular physiology	Several/day	49	58	44	Very	79	81	77	Formal	55	47	60.5
Connective tissue physiology	Several/day	61	70	54.5	Very	82	83	81	Formal	50	42	56
4. Kinesiology (Biomechanics of the Upper Extremity)												
Pulley system	Several/day	60	69	53	Very	84	90	80	Formal	47	35	54.5
Intrinsic/extrinsic muscle function	Several/day	73	80	68	Very	88.5	90	87	Formal	53	40	61
Lever systems	Several/day	55	65	49	Very	79	81.5	77	Formal	57	49	63
Effects of external forces (i.e., stress, strain)	Several/day	63	73	56	Very	81	84	79	Formal	45	36	51
Isometric, isotonic, isokinetic muscle forces	Several/day	66.5	76	60	Very	80	85	77	Formal	63	53	69
5. Physics												
Absorption/penetration of various heat sources in normal and abnormal tissues	Several/day	37	43	34	Very	53	55.5	52	Formal	35	27	40
Heat and bioelectric current generation and conduction	Do not perform	40.5	41.5	40	Very	45	47	44	Formal	33	25 ^b	38 ^c
Tissue and nerve response to parameters of electric stimulation	Do not perform	37	37	37	Very	45	44	46	Formal	32	25 ^d	37 ^c
6. Comprehensive understanding of surgical procedures of the upper extremity and their post-operative course	Several/day	67	82	57	Very	91	95	87	On-the-job	52	59	48

^a More nonmembers (36%) selected Formal OT or PT education.

^b More ASHT members (31%) selected Did not learn.

^c More nonmembers (30%) selected Did not learn.

^d More ASHT members (27%) selected Did not learn.

^e More nonmembers (29%) selected Did not learn.

electrophysiological techniques, were judged very important although many of the respondents do not perform them. Respondents may have limited exposure to the techniques and not feel competent to perform them, yet recognize the importance of the techniques to practice. Table 3 shows that those activities most often eliciting the "Do not know" response in the importance dimension also fall into the "Do not perform" category in the frequency dimension and the "Did not learn" category in the education dimension. Perhaps these results indicate that respondents are reluctant to judge the importance of activities, skills, or modalities with which they are unfamiliar.

Theory and Knowledge. Table 4 shows strikingly homogeneous responses in the importance and frequency dimensions of the theory and knowledge section of the survey. On the importance dimension, all of the concepts received high ratings from the respondents. On the frequency dimension, respondents most often said they apply all concepts several times a day, with the exception of two areas in physics. These areas—heat and bioelectric current generation and conduction, and tissue and nerve response to parameters of electric stimulation—are not

widely applied but are considered to be very important. A third area of physics concerning the absorption/penetration of heat sources in tissues may be taught in formal education more commonly than the other two areas, but respondents said the application of all three is very important.

Substantially more ASHT members than nonmembers said they apply their knowledge of histology, kinesiology, and surgical procedures several times a day. This difference may reflect the greater number of hand trauma cases encountered in the specialized settings where ASHT members more often said they work. If ASHT members see a higher percentage of acute and complex hand trauma cases, they would have to call on the principles in these three categories of knowledge more often than nonmembers. Principles of applied histology are applicable in cases of acute hand trauma, while kinesiology principles are more applicable in reconstructive hand surgery and advanced splint design. The principles of surgical procedures may be more useful for ASHT members working in hand centers, since they often would have more contact with hand surgeons and more opportunities to observe surgery.

The concepts in the theory and knowledge sec-

TABLE 4. (Continued.)

<i>LEARNING</i>	<i>%T</i>	<i>%M</i>	<i>%N</i>
Formal	58	53	61
Formal	56	52	59
Formal	55	51	57
Formal	68	65	71
Formal	67	65	68
Formal	66	64	67
Formal	65	64	66
Formal	64	61	66
Formal	67	64	69.5
Formal	67	66	68
Formal	64	62	65
Formal	70	70	70
Formal	60	55	62.5
Formal	58	55	60.5
Formal	59	55	61
Cont ed	37	39	36

tion are most frequently learned in formal education, except for an understanding of surgical procedures, which many learn on the job, and histology, which many learn in continuing education. Histology is not generally offered as a course in OT and PT curricula; therefore, the principles of histology are likely to be introduced in continuing education.

Finally, many respondents said that all of the concepts should be taught in formal OT or PT education except for an understanding of surgical procedures. The responses may indicate that therapists believe structured curricula with an emphasis on the integration of theory and knowledge best prepare them for clinical practice. However, the respondents' desire for an ongoing education in the surgical area may reflect the diverse and often innovative nature of hand surgery procedures. Knowledge in the surgical area may be obtained through observation of surgery, interaction with hand surgeons, and continuing education courses.

CONCLUSION

The role delineation study of hand therapy serves three major purposes. First, it can serve as a focus for

TABLE 5. Certification Issues.

FAVORING CERTIFICATION		%
Yes		55
No		45
EFFECTS ON PROFESSION		
Improve the quality of patient care		67
Improve standards of practice		66.5
Limit practice		62
Increase professional prestige		61
Increase salaries		37
Add to cost of care		32.5
Limit people from practicing		32
Improve job opportunities		22
Increase competition for patients		17
PERSONAL EFFECTS		
Increase prestige		60
Improve standards of practice		52
Improve hand therapy skills		46
Increase reimbursement		27
Improve job opportunities		21
Increase salary		16
TEST FORMAT		
Written (multiple choice)		44
Written/oral/practical		33
Written/oral		16
MAXIMUM EXAMINATION FEE		
\$50-\$100		51
Less than \$50		25
\$101-\$200		11
\$201-\$300		4
Cost not a factor		7.5
More than \$300		Less than 1
WHO WOULD PAY FOR CERTIFICATION?		
Self		81
Employer		17
IS PRACTICE WITHOUT REFERRAL APPROPRIATE FOR HAND THERAPY?		
No		75
Yes		25

the development of educational objectives, both with respect to curriculum design in therapy and continuing education programs, and the assessment of regional continuing education needs. Second, the data base can be utilized for further research on the delineation of the profession. A multiplicity of analyses among the various subgroups identified in the study is possible, which would contribute, for example, to a greater understanding of the difference between entry-level and advanced skills and knowledge in hand therapy, or to the identification of future trends in the profession. Third, the role delineation study can be viewed as the empirical basis for the sound design of standardized testing programs in hand therapy. The use of this occupational analysis to define the content areas for self-assessment or certification

examinations will serve as a strong foundation for a valid examination process.

REFERENCES

1. The Robert Wood Johnson Foundation: Medical Practice in the United States: A Special Report. Princeton, 1981.
2. Baird SC, Armstrong RV: Role Delineation for the Field of Clinical Dietetics. Chicago, American Dietetic Association, 1981.
3. D'Costa A, Schreck A: The Role of Dietary Manager. Chicago, Hospital, Institution, and Educational Food Service Society, 1983.
4. Kane M, Kingsbury C, Colton D, Estes C: A Study of Nursing Practice and Role Delineation and Job Analysis of Entry-level Performance of Registered Nurses. Chicago, National Council of State Boards of Nursing, Inc., 1986.

Definition and Scope of Practice of the Profession of Hand Therapy

The hand therapy definition and scope of practice were written based on the results of the job analysis survey. It was adopted by the membership of the American Society of Hand Therapists in April 1987.

DEFINITION OF HAND THERAPY

Hand therapy is the art and science of rehabilitation of the upper extremity. Hand therapy has developed from the professions of occupational therapy and physical therapy. The hand therapist combines comprehensive knowledge of the upper extremity with specialized skills in assessment and treatment to prevent dysfunction, restore function or reverse the advancement of pathology in the upper extremity. The goal of hand therapy is to promote health and well-being through rehabilitative services to individuals with upper extremity dysfunction and to develop and disseminate effective innovations in upper extremity rehabilitation.

HISTORICAL EMERGENCE OF HAND THERAPY

The specialty of hand therapy developed in response to advances in surgical techniques that enabled greater functional restoration of injured and diseased upper extremities. Such restoration requires the therapeutic intervention of a skilled, specialized practitioner who is able to integrate the principles of rehabilitation with these surgical interventions. Specialists in hand therapy employ therapeutic techniques derived from both occupational therapy and physical therapy. This merger of traditional skills from these two professions in combination with innovations evolving from practice has produced the specialized field of hand therapy.

WHO ARE HAND THERAPISTS?

Hand therapists are registered or licensed occupational therapists or physical therapists, who through advanced continuing education, clinical experience and independent study have become proficient in the treatment of pathological upper-extremity conditions resulting from trauma, disease, congenital deformity or acquired deformity. Hand

therapists have gained a comprehensive body of knowledge and skills related to upper-extremity rehabilitation that exceeds the professional requirements established for entry-level occupational therapists or physical therapists.

THEORETICAL BASIS OF HAND THERAPY

The foundation of hand therapy is comprehensive understanding of:

1. Anatomy of the upper extremity and how it is altered by pathology;
2. Histology as it relates to tissue healing and the effects of immobilization/mobilization on connective tissue;
3. Muscle, sensory, vascular and connective tissue physiology;
4. Kinesiology of the upper extremity such as biomechanical principles of pulleys, intrinsic/extrinsic muscle function, internal forces of muscles and the effects of external forces;
5. The effects of temperature and electrical currents on nerve and connective tissues;
6. Surgical procedures of the upper extremity and their postoperative course.

HAND THERAPY ASSESSMENT

The skills used in the application of this knowledge include assessment of:

- Surface topography
- Wound and scar condition
- Edema
- Vascularity
- Sensibility
- Range of motion
- Strength
- Dexterity
- Prosthetics
- Orthotics
- Work capacity
- Activities of daily living
- Hand function
- Psychosocial skills

HAND THERAPY TREATMENT

In compliance with state and federal law, individualized treatment is based on the results of this assessment and may be provided on a one-to-one basis, in a group, or by consultation. Treatment may include but is not limited to:

- Wound management
- Scar management
- Edema control
- Pain control
- Sensory reeducation
- Range of motion exercises
- Strengthening
- Dexterity training
- Prosthetic training
- Orthotic fabrication and training
- Work conditioning
- ADL training

A variety of techniques may be used to augment the treatment and may include but are not limited to use of:

- Therapeutic heat and cold
- Manual therapy
- Electrophysiological techniques
- Neuromuscular techniques
- Purposeful activities
- Provision of adaptive equipment

In addition, hand therapists engage in patient and family education to promote their active participation in the treatment process.

RELATED ACTIVITIES

Hand therapists are committed to advancing the field of upper extremity rehabilitation through scientific and clinical research, academic and clinical teaching and publication.

AMERICAN SOCIETY OF HAND THERAPISTS