Occupational Medicine Practice: One Specialty or Three?

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Objective: To characterize education, practice, and skills of occupational physicians and to evaluate subgroups within the profession. **Methods:** The data for the baseline surveys of the occupational medicine practice research project were collected for a national sample of occupational physicians using paper or on-line instruments. Three subgroups were defined a priori-injury care, clinical specialist, and management/population. **Results:** Occupational medicine seems to include three distinct subgroups, which differ in characteristics such as patient volume, relevant clinical skills, and income source. Nevertheless, many commonalities were present across all three groups, such as emphasis on communication, OSHA, and workers compensation. Musculoskeletal and workers compensation care were most important, although there were highly significant differences among the three subgroups. **Conclusions:** Planning for education, certification, and organization of services should acknowledge the distinctions among the three subgroups.

The University of California at Los Angeles occupational medicine practice (OMP) research project addresses several basic questions about occupational medicine: What do occupational physicians actually do? What skills do they use? What are the characteristics of physicians who practice occupational medicine? Furthermore, because occupational medicine is characterized by considerable diversity of activities, OMP is also investigating whether there are identifiable subgroups within the profession.

Understanding the nature of occupational medicine practices can guide educational curricula and professional certification processes. In addition, this information may affect the organization of service delivery and inform policy decisions about the optimal size of the occupational medicine workforce.[1–4] Skills unique to occupational medicine may also support appropriate payment for service.

Several approaches have been used to determine what occupational physicians actually do; however, a recent systematic literature review suggested a dearth of objective information.[5] Methods have included surveys of physicians in the specialty,[6–10] surveys of recent graduates,[11,12] formal consensus methods,[13,14] "expert" committees,[15] and surveys of clients such as employers.[6,7,13] A small number of studies used direct observation of physician practice or measurement of work output.[16–18] OMP uses several different methods for addressing these questions. This report summarizes the baseline survey of self-reported practice skills, activities, and educational backgrounds. These data were evaluated to gain insight into the question of whether occupational physicians' practices are fundamentally similar or whether there are distinct subgroups with little overlap. OMP will also collect activity logs, in which physicians describe their work at multiple specific times in a sampling frame.

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METHODS

The study was approved by the University of California at Los Angeles Institutional Review Board, and all subjects provided informed consent for participation. Subjects were asked to complete three types of information:

1. Self-reported: introductory and exit questionnaires completed one time addressing areas such as educational experience, practice location, and overall importance of activities and skills.
2. Direct report: activity log forms recorded brief descriptions of activities performed at a specific time (repeated up to five times a day for 5 days).
3. Rating scale: end of day questionnaire—a brief summary of daily activities completed at the end of each participation day.

This study is based on the self-descriptive data collected in the introductory and exit questionnaires. All subjects who completed these questionnaires are included in this analysis, even if they dropped out before completing the anticipated number of activity logs.

Survey instruments were available either in an on-line version (Survey Monkey; Portland, Oregon) or using hardcopy format. Questions were comparable, and most subjects preferred the on-line version.

Subjects were recruited by notices in professional organization newsletters, e-mails to lists of occupational physicians, and on-site recruitment at meetings of occupational health professionals. Several organizations agreed to serve as collaborators and encourage participation. These included the Western Occupational and Environmental Medical Association and the American College of Occupational and Environmental Medicine. Other organizations included the Central States Occupational Medicine Association and the National Association of Occupational Health Professionals.

Table 1 summarizes the questions used for these analyses. Many questions used a series of ordered response categories, which were then aggregated for analysis into three categories (low/mid/high). The questions fell into several general groups:

a. Professional education and certification.
b. Practice characteristics.
c. Importance of skills and activities to the respondent's personal practice.
d. Importance of skills and activities to the field in general.
e. Sources of income.

Before data collection, the investigators hypothesized that physicians could be classified into one of three practice groups, which were defined on a priori basis. Subjects were assigned based on the response to the question, "Which of the following best characterizes your practice?," as shown in Table 1. The three groups are injury care (IC), clinical specialist (CS), and management/population (MP). In addition to these three groups, several additional analyses used a seven-class grouping scheme (G7), which was based on the direct answers without any aggregation.

TABLE 1. Question Groups and Coding

Question Group and Choices	Coded Response Category
A. EDUCATION & CERTIFICATION	
Career stage: What year did you graduate from medical school?	Career stage
Before 1975	Late career
1976–1985	Senior career
1986–1995	Mid career
After 1996	Early career
Certification: Are you board certified in — (eg, Occupational Medicine)?	Certified/eligible
Certified	Yes
Eligible	Yes
Not selected	No
B. PRACTICE CHARACTERISTICS	
Setting: Select your main practice setting:	
Private practice (3 or fewer physicians in group)	
Private practice (4 or more physicians in group)	
HMO (staff model)	
Corporate	
Government/State institution	
Consulting company	
University/academia	
Other (please specify)	
Number: For each of the following, please describe the number of patient encounters in a typical week: (eg, total patients)	
0–10	Low
11–25	Mid
>25	High
Frequency: Please describe how often YOU typically do the following activities: (eg, treating injuried workers)	
Never	Low
Occasionally (1–2×/month)	Mid
Often	Mid
Frequently (at least 3×/week)	High
Very often (Daily)	High
C. IMPORTANCE OF SKILLS TO PERSONAL PRACTICE	
In your opinion, how important are each of the following skills for YOUR practice? (eg, toxicology)	
N/A	Low
Not very important	Low
Little important	Low
Somewhat important	Mid
Important	High
Very important	High
D. IMPORTANCE OF SKILLS TO FIELD IN GENERAL	
(Similar to C above)	
E: INCOME SOURCES	
Income: What percentage do the following sources of income contribute to your occupational and environmental medicine activities? (eg, workers compensation treatment)	
None	Low
Small (<5%)	Low
Limited	Mid
Significant (50% to 80%)	High
Major (>80%)	High
PRACTICE GROUP CLASSIFICATION SCHEME	Practice group
Practice Group: Which of the following best characterizes your practice?	
Clinical practice: treating injured/ill workers	IC
Clinical practice: medical-legal evaluations	CS
Corporate practice: mainly clinical	IC
Corporate practice: mainly administrative/managerial	MP
Consulting practice: mainly nonclinical	MP
Government or university: mainly clinical	CS
Government or university: mainly nonclinical	MP
(For G7, the direct answer was employed)	

The table summarizes the major groups of questions, provides an example of each, lists choices available to subjects, and shows how categories were combined. IC indicates injury care; CS, clinical specialist; MP, managment/population.

Inaddition to analyzing responses to individual questions, for each subject, a weighted composite score for three aggregates was calculated—IC aggregate (ICA), CS aggregate (CSA), and MP aggregate (MPA). This was accomplished by assigning points for selected questions as shown in Table 2. The weights were selected before data analysis. Because the scales differed in the maximal total points, each subject's score for the three composite indices were transformed into z scores that were based on means and standard deviations determined for each scale across all three practice groups.

Data were managed using a relational database system (Microsoft Access, Redland, WA), spreadsheet program (Microsoft Excel, Redland, WA), and statistical analysis software (SAS for PC, version 9.1;SAS, Cary, NC). Statistical analyses were conducted for descriptive purposes and to test differences among groups. The latter analyses used hypothesis testing methods for categorical data. Methods included χ^2, Mantel-Haenszel, and Fisher exact tests as appropriate. Mantel-Haenszel was used when the data categories were ordered, and Fisher exact was used when low values in some table cells precluded use of the other techniques. One-way analysis of variance (ANOVA) was used for the composite scores.

RESULTS

Responses of the subjects are summarized in Table 2. Results are shown for the total group of respondents and for each of the

TABLE 2. Frequency of Responses Overall and By Practice Group

	Overall (%)			Within By Practice Group[a] (%)									P	Composite Weight[b]		
				IC (N = 73)			CS (N = 27)			MP (N = 54)				ICA	CSA	MPA
Career stage																
Late career	12			7			23			13			MH*			
Senior career	40			40			31			44			NS			
Mid career	31			29			31			33			NS			
Early career	17			24			15			9			NS			
Certified/eligible													NS			
Occupational medicine	85			79			81			94			CH**			
Preventive medicine	22			18			15			31			CH			
Internal medicine	27			23			26			31			CH			
Family medicine	21			22			15			24			CH			
Emergency medicine	4			7			0			2			FE			
Pediatrics	1			1			4			0			FE			
Aerospace med	6			5			4			7			FE			
Toxicology	4			3			4			6			FE		(Y) 1	
Surgery	1			3			0			0			FE			
	L	M	H	L	M	H	L	M	H	L	M	H				
Frequency in personal practice																
Total patient visits	28	10	62	0	6	94	22	7	70	70	18	12	MH***	(H) 1		(L) 1
Preplacement examinations	61	0	39	37	0	63	63	0	37	96	0	4	MH***		(H) 0.5	
Medical surveillance examinations	68	0	32	56	0	44	63	0	37	88	0	12	MH**		(H) 0.5	
Fitness for duty examinations	93	0	7	87	0	13	96	0	4	100	0	0	FE**		(H) 1	
Workers compensation/legal evaluations	71	0	29	56	0	44	78	0	22	88	0	12	MH**	(H) 0.5		
Other med/legal evaluations	99	0	1	100	0	0	100	0	0	96	0	4	FE			
General medical care (nonoccupational)	78	0	22	76	0	24	70	0	30	86	0	14	MH			
Children (<16 yr old)	100	0	0	100	0	0	100	0	0	100	0	0	FE			
Treating injured workers	13	26	61	0	7	93	12	23	65	33	54	13	MH**	(H) 1		(H) 2
Medical surveillance examinations	21	35	64	8	30	62	19	31	50	40	46	15	MH***		(H) 0.5	
Performing medical-legal examinations	30	52	19	24	56	20	8	58	35	50	42	8	MH**		(H) 1	
Consulting industry/employers	19	54	26	20	65	15	19	50	31	19	42	40	MH**			(H) 1
Visiting workplaces	19	73	8	14	79	7	31	58	12	21	73	6	FE			(H) 1
Other nonclinical consulting	25	53	22	34	55	11	27	50	23	11	51	38	MH***			(H) 1
Prevention activities	12	60	58	10	66	24	27	38	35	6	63	31	MH		(H) 0.5	(H) 0.5
Importance of fields/skills in personal practice																
Toxicology	23	21	56	30	24	46	4	15	81	25	19	56	MH		(H) 1	
Musculoskeletal	8	9	83	0	0	100	15	4	81	15	25	60	FE***	(H) 1		
Epidemiology	30	30	40	42	34	24	19	31	50	19	23	58	MH**			(H) 1
Industrial hygiene	29	28	43	35	38	27	12	31	58	29	13	58	MH		(H) 0.5	(H) 1
Strategic planning	28	25	47	38	24	38	31	35	35	13	21	67	MH**			(H) 1
Patient education	9	10	81	1	3	96	15	8	77	17	21	63	FE***		(H) 0.5	(H) 0.5
Environmental Protection Agency	52	27	21	59	25	15	42	27	31	46	29	25	MH			(H) 1
OSHA	13	22	64	11	20	69	12	27	62	19	23	58	MH			(H) 1
Worker's compensation	8	8	85	1	1	97	4	12	85	19	15	67	FE***			(H) 1
Management skills	9	13	78	11	17	72	8	12	81	6	8	85	FE			(H) 1
Communication/presentation	6	10	85	8	15	76	4	8	88	2	2	96	FE**			(H) 1
Acute emergency care	38	16	46	13	18	69	31	23	46	79	8	13	MH***	(H) 1		
Slit lamp	59	15	26	39	23	38	62	12	27	88	6	6	MH***	(H) 1		
Joint/soft tissue injection	50	9	41	24	10	66	58	8	35	85	8	6	FE***	(H) 1		
Suturing	41	7	52	13	4	83	54	8	38	75	10	15	FE***	(H) 1		
Group presentation skills	30	21	50	42	26	32	26	17	57	13	15	72	MH**			(H) 1
Occupational medicine residency	34	12	54	43	6	51	27	9	64	22	22	56	MH*			
Residency in another field	30	14	56	33	15	52	17	9	74	33	16	51	MH			
Public health	33	27	40	33	37	30	35	22	43	30	15	54	MH			(H) 1

(*continued*)

TABLE 2. (*Continued*)

	Overall			IC			CS			MP				Composite Weight[b]		
	L	M	H	L	M	H	L	M	H	L	M	H	*P*	ICA	CSA	MPA
Importance to field in general																
Occupational toxicology	5	18	77	8	18	73	0	15	85	2	19	79	FE		(H) 1	
Musculoskeletal	1	3	95	0	0	100	0	12	88	4	4	92	FE**	(H) 1		
Epidemiology methods	10	37	53	13	42	45	4	38	58	10	27	63	FE			(H) 1
Industrial hygiene evaluation	8	39	53	7	44	49	0	27	73	13	40	48	FE			(H) 1
Strategic planning	18	35	46	18	35	46	16	32	52	13	40	48	MH			(H) 1
Patient education	3	10	86	3	6	92	4	12	85	4	17	79	FE			
Environmental protection agency	21	30	49	20	31	49	19	27	54	25	29	46	MH			
Worker's compensation	1	4	94	0	3	97	0	4	96	4	6	90	FE			
Management skills	8	18	74	10	14	76	8	27	65	6	19	75	FE			(H) 1
Communication/presentation	2	14	84	4	13	83	0	12	88	0	17	83	FE		(H) 1	(H) 1
Acute emergency care	17	23	61	3	17	80	19	23	58	36	30	34	MH***	(H) 1		
Slit lamp	33	28	40	23	27	51	44	20	36	42	33	25	MH**	(H) 1		
Joint/soft tissue injection	26	28	46	13	24	63	31	19	50	44	38	19	MH***	(H) 1		
Suturing	18	15	67	3	13	84	24	20	56	38	15	47	FE***	(H) 1		
Income sources																
Worker's compensation treatment	41	11	48	15	4	81	54	19	27	73	16	12	MH***	(H) 1		(L) 1
Worker's compensation med/legal	68	22	9	70	22	8	46	31	23	78	18	4	FE**		(H) 1	
Payment from companies directly	46	17	37	36	23	41	54	15	31	57	10	33	MH*			(H) 1
Private insurance	8	9	83	88	7	5	77	19	4	96	4	0	FE*	(H) 1		
Medicare/medicaid	95	3	2	95	4	1	85	8	8	100	0	0	FE*	(H) 1		
Research and consulting contracts	83	11	5	97	3	0	73	23	4	69	18	14	FE***			
Research grants	92	6	2	99	1	0	85	12	4	86	10	4	FE**			(L) 1

[a]The table shows the proportion providing each response overall and within each practice group.

[b]The composite score columns show the weight to which each response contributes to the three composite aggregate scores. CH, MH, and FE defines the method for testing differences among groups.

*$P < 0.10$; **$P < 0.05$; ***$P < 0.0001$.

Y indicates yes; L, low; M, mid; H, high; CH, χ^2; MH, Mantel-Haenzsel; FE, Fisher exact; NS, not significant.

practice group subtypes. Three aggregate groups were defined before data collection.

The participating physicians were focused in the field of occupational medicine itself. Occupational medicine was the sole field of their practice for 60% of them, whereas 40% combined occupational medicine with another medical specialty. Participants included both physicians predominantly in clinical practice as well those whose work was primarily nonclinical. Approximately 60% were in mainly clinical practices. The participants represent most of the major practice settings in the field of occupational medicine, including corporate, university, government, large group practice (eg, staff model HMO), and smaller private practice. As might be expected, those in clinical practice settings reported predominantly clinical practice.

A high proportion of the participants were formally trained in occupational medicine. Only 21% were not certified or board eligible in the field. Although the proportion who were in occupational medicine differed among the three practice groups ($P < 0.05$), it was 79% even among the lowest (IC) group. Many were trained in other fields and occupational medicine, particularly internal medicine (27%), preventive medicine (22%), and family practice (21%). Aerospace medicine certification was held by 6%, and only 4% were certified in medical toxicology. Other fields were much less common. These were distributed across all three practice groups. Among those completing occupational medicine residencies, ~2/3 felt their OM residency was important to their daily activities (Table 2).

The participating physicians represented all career stages: late, senior, mid, and early career. As shown in Table 2, differences in career stage distribution by practice group was of borderline statistical significance ($P = 0.08$). The IC group tended to have a higher proportion of early and mid career occupational physicians (53% in early or mid career), and the CS and MP groups tended to have more experienced physicians (54%, 57% late or senior career stage, respectively). Nevertheless, IC physicians constituted large proportions of all career stages. There was a nonstatistically significant trend for medical school graduation year, presumably also reflecting age, to be associated with practice type. Relatively few early career physicians defined as graduating from medical school after 1996 and were in management population practices, whereas this was much more common for senior physicians (10% vs 48%).

Practice Characteristics

Overall, the physicians reported an average of 54 patients per week (median = 50). The MP group, however, did little patient care; 70% reported low patient load (<10 per week), and 18% reported 11 to 25 per week. Most patient activity was in occupational health per se. Overall, 78% were in the low category for nonoccupational patients. Children and nonoccupational exposures were rarely seen. For each type of patient encounters except medical-legal, the IC physicians had the highest patient load. The IC physicians had significantly higher volumes in total patient visit, preplacement examinations ($P < 0.0001$), medical surveillance examinations ($P = 0.0002$), fitness for duty examinations ($P =$

0.011), and workers compensation/legal evaluations ($P = 0.0002$) than the CS and the MP groups.

Subjects rated the frequency of several specific activities in their personal practices. All the subjects participated in prevention-oriented activities. Direct treatment of injured or ill workers and surveillance examinations constituted the most frequent self-reported activities. Activities differed among the groups. The IC group predominately practiced injury treatment ($P < 0.0001$) and conducted medical surveillance examinations ($P < 0.0001$). The MP group was more focused on medical-legal functions ($P < 0.01$), and the CS group was active in consulting industry ($P < 0.05$).

Skills

The participating physicians assessed the importance of several categories of skills to their personal practices and to the field in general. For most items, there was reasonable concordance between their practices and their assessment of the overall field. The single most important skill they identified was musculoskeletal competency (83% rated this in the highest two categories of significance for personal practice and 95% did so for the overall field).

Knowledge of workers compensation was also considered important by most. As with musculoskeletal expertise, there were significant differences by group. Fewer clinical subspecialists considered it important to their personal practice than did IC physicians (60% vs 100%, $P < 0.0001$). Knowledge of toxicology was considered highly important for personal practice by about half the participants, although many more recognized it as highly important to the profession overall. Although many IC physicians felt toxicology was not very important to their personal practices (30%), they still considered it important to the overall field (97%).

Knowledge of epidemiology, industrial hygiene, and OSHA was considered very important by slightly fewer than half. Familiarity with EPA was considered less relevant than OSHA to personal practice.

Skills related to groups/populations rather than single patient-oriented skills were also considered important by occupational medicine physicians. For example, 41% rated public health skills as important. There were differences by practice settings. The IC physicians were less likely than the other groups to highly value group presentation skills.

The physicians also felt that communication skills were essential to their personal practice and to the field in general; 85% considered group presentation skills to be significant and 81% considered patient education skills to be highly important.

Several specific clinical skills differed markedly among the groups. The skills particularly used by IC group members included acute emergency care, slit lamp use, suturing, and joint injection. For these skills, the three groups also had large differences in estimated importance to occupational medicine in general. For example, joint/tissue injection was considered important by 63% of IC but only 19% of MP physicians. Among the latter group, 38% considered suture skills to be not important.

Clinical activities that are specific to occupational medicine were practiced by both IC and CS groups. Such activities include fitness for duty, surveillance, and preplacement evaluations. Nevertheless, these accounted for a small proportion of the total patient loads.

Income Sources

Table 2 also describes self-reported sources of income. Self-stated income sources were classified into "low" (<5%), "mid" (6% to 50%), and "high" (>50%). Income sources differed by practice type. The physicians' incomes were derived mainly from occupational health.

Workers compensation care accounted for the single greatest source of income with 48% of participants reporting high income from workers compensation treatment. Nevertheless, 41% of the physicians reported little or no income from workers compensation-related treatment. A high proportion (81%) of IC physicians received most of their income from workers compensation treatment. However, 73% of the MP reported low income from workers compensation treatment.

Workers compensation medical-legal income was the major income source for only 9% of participants. Nevertheless, it was very important for clinical subspecialist practitioners, reporting 23% and 31% in the high and mid levels, respectively.

Private insurance and Medicare were relatively unimportant income sources for the participants. Only 2% reported high income from Medicare. The clinical subspecialist physicians were most involved with private insurance/Medicare income sources, but even for them, 85% characterize Medicare as low. Contract and grant income was of limited significance. Striking differences were noted according to practice group, however, with virtually all IC physicians reporting low contract and grant income.

Subgroup Analysis

Several indicator variables were chosen to examine differences within the three large practice groups. Results are shown in Table 3. Clinical care was similar whether practiced in a noncorporate, corporate, or government/university setting. For example, all three "mainly clinical" settings had high patient loads and physicians in all three ascribed high importance to musculoskeletal disorders. Nevertheless, there were some differences. In the government/university or corporate settings, whether clinical or nonclinical, management skills were considered more important than in the other settings. In addition, OSHA was particularly important in the corporate setting, although differences were not statistically significant. Corporate clinicians were, however, less likely than noncorporate clinicians to receive high income from workers compensation-related treatment activities than other clinicians.

In clinical practice settings, direct payment was generally low. Conversely, for those in nonclinical settings, workers compensation treatment was much less significant, with 75% falling into the "low" category for workers compensation treatment income. Nevertheless, income from medical-legal activities was more strongly reflected in the university, consulting company, government, and corporate settings.

Composite Analysis

Figure 1 graphically summarizes the characteristics of each group. (Because the maximum possible score differed for the three composite indices, data were z-transformed to produce comparable scales.) The three practice groups differed significantly in each composite score as determined by one-way ANOVA. The IC group was distinctly different from the MP group. Although the ICA and CSA composite scores were clearly different among the groups, there was considerable overlap for the MPA indices, supporting the conclusion of underlying commonalities.

DISCUSSION

Understanding the activities, skills, and competencies of occupational medicine physicians is central to establish educational goals properly and for guiding the organization of health services. It may also affect payment criteria by identifying specialty unique skills that differentiate occupational physicians from others who may treat the same physical ailments. Even for the same condition, the approach taken to the problem may differ according to specialty background.[19–21]

Three Distinct Groups

IC physicians are the primary "front line" care providers in occupational medicine settings; their role is analogous to that of

TABLE 3. Responses by Subgroups

	Clinical Practice		Corporate		Consulting	Government or University		
	Treating Injured/ Ill Workers	Medical-Legal Evaluations	Mainly Clinical	Mainly Managerial	Mainly Nonclinical	Mainly Clinical	Mainly Nonclinical	*P*
Career stage								
Late career	7	50	9	6	13	10	21	NS
Senior career	39	50	45	59	63	10	26	
Mid career	30	0	27	24	25	60	42	
Early career	25	0	18	12	0	20	11	
Worker's comp treatment								
Low	6	100	64	67	75	60	79	***
Mid	5	0	0	20	25	20	5	
High	89	0	36	13	0	20	16	NS
Importance of management skills								
Low	9	0	0	8	38	0	0	NS
Mid	36	67	9	0	13	13	25	
High	55	33	91	92	50	88	75	
Total patient visits								
Low	0	80	0	63	88	0	65	***
Mid	2	0	27	19	0	10	24	
High	98	20	73	19	13	90	12	
Occupational toxicology								
Low	30	20	27	20	38	0	29	NS
Mid	23	0	27	7	0	30	29	
High	47	80	45	73	63	70	41	
Musculoskeletal examinations								
Low	0	60	0	20	25	0	6	*
Mid	0	0	0	33	25	10	24	
High	100	40	100	47	50	90	71	
OSHA								
Low	12	20	9	13	38	10	6	NS
Mid	23	60	0	7	38	30	35	
High	65	20	91	80	25	60	59	

Responses to selected questions are shown for seven groups (G7). Responses are for personal practice only and not for opinions about the field in general.
*$P < 0.10$, ***$P < 0.0001$.
NS, not significant.

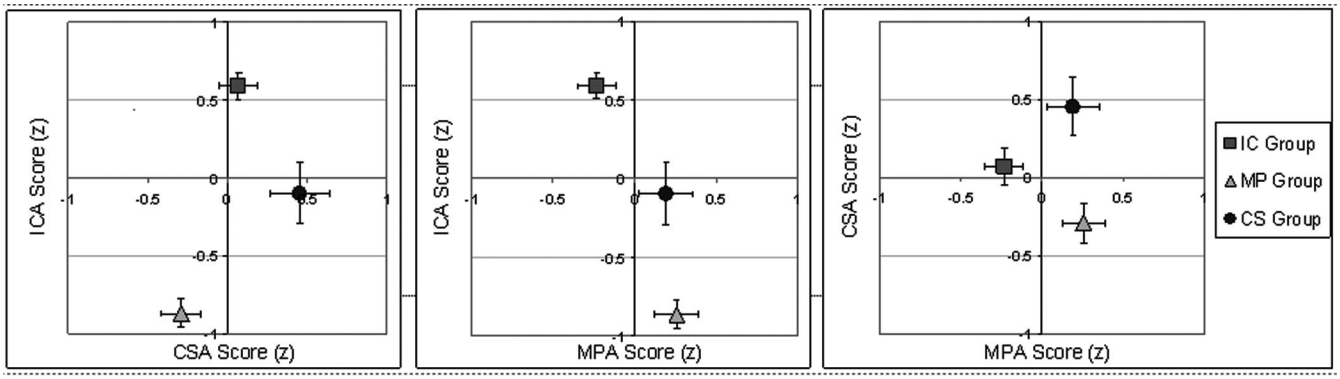

FIGURE 1. IC, CS, and MP composite scores (z) aggregates for the three practice groups. The figure shows composite scores (mean and standard error of the mean) for the three practice groups along the following scales: (A) ICA and CSA; (B) ICA and MPA; (C) CSA and MPA scales. Individual subjects' scores were z-transformed. Scores for each practice groups are shown as follows: squares, IC; triangles, MP; circles, CS. Differences among the groups were statistically significant for all three scales ($P < 0.05$ by ANOVA). ICA and CSA scores show clear separation among the groups, whereas overlap is observed for the MPA indices.

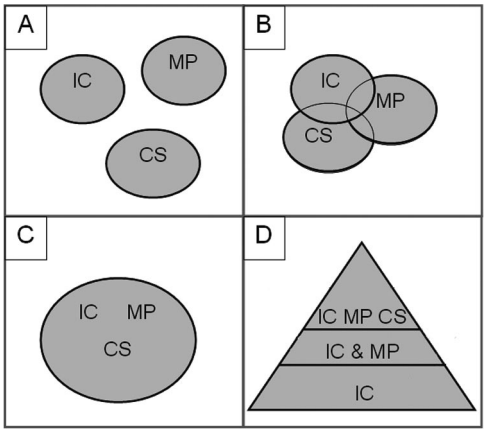

FIGURE 2. The figure summarizes possible relationships among the three practice groups: (A) Three distinct specialties with very little in common. (B) Three distinct subspecialties but sharing some common activities and skills. (C) Occupational medicine is a single homogeneous specialty. (D) Some occupational medicine physicians are competent in all areas and others with capabilities limited to only one of the areas. (Terms are summarized in Table 1.)

primary care physicians such as family practitioners or general internists in other settings. They see many patients each week, and they depend very heavily on workers compensation for income. Most of their work is in the area of treatment. Musculoskeletal conditions are the most prevalent. Several skills and specific activities clearly differentiate them from members of the other two groups. IC physicians consider acute and emergency care skills to be vital. Their work includes suturing, joint injections, and patient education.

Clinical subspecialist physicians are also clinically oriented, but their patient volume is lower and differs in focus from the IC group. Musculoskeletal medicine is less important, but medical-legal evaluations are significant in this group. This group's practice is less restricted to occupational medicine than the other groups; for example, proportionately more income is derived from Medicare and private insurance than in the other groups. It is possible that the physician practices in another field as well as in occupational medicine. For example, the clinical subspecialist group may be exemplified by a dermatologist with particular interest in occupational contact dermatitis and in disability evaluation.

Members of the MP group have considerably less direct clinical contact. They do little direct patient care, musculoskeletal medicine is significantly less important, and treatment procedures such as suturing are irrelevant. Nevertheless, planning and group communication skills, although important to all groups, are essential to the MP group.

It is difficult to predict whether one of the three roles will become dominant in the future. For example, in 1991 some opined that the role of "consultant" would become dominant for residency trained physicians,[22] whereas it seems that the "IC" role has been increasingly important.

Commonalities

Is occupational medicine a bona fide specialty? Despite the differences among the three groups, occupational physicians have many characteristics in common. Many of these common areas are likely to differentiate the specialty of occupational medicine from other medical fields. Communication and management skills are considered significant across all three subareas. Other studies have also found that communication skills are highly valued in occupational health.[1,7,12,13] Knowledge of OSHA is also important, being rated in the highest category by ~60% of physicians in each of the groups.

The practices of occupational physicians focus in occupational health. Nonoccupational health care constitutes a small percentage of activity for nearly all physicians. "Environmental medicine" was considerably less relevant than "occupational medicine" to the practices of the study participants. For example, knowledge of EPA was not considered nearly as important as knowledge of OSHA. Physicians reported almost no pediatric activities, although children are prominent in considerations of environmental medicine.

Is occupational medicine a single specialty? Fig. 2 suggests several possible relationships among the practice areas:

a. Occupational medicine is actually three distinct specialties with very little in common.
b. Occupational medicine includes three distinct subspecialties but they share a significant amount of common activities and skills.
c. Occupational medicine is a single homogeneous specialty.
d. Occupational medicine includes some physicians who are competent in all areas and others with capabilities limited to only one of the areas.

This study does not fully answer this question, but it does suggest that the second option "B" is most likely. These preliminary results support the concept that occupational medicine includes three subgroups that differ significantly. Nevertheless, there are sufficient common areas to warrant considering occupational medicine to be a single field. Many of these common areas of emphasis differ from the emphasis in other fields of medicine and demarcate occupational medicine as a specialty.

The data do not support the hypothesis of temporal transitions, in which physicians first practice IC medicine and then become "promoted" to MP medicine or to CS practice. For example, although there are some minor differences, physicians at all four career stages practice in each of the three settings.

In general, the nature of the practice rather than the organizational location of the practice determined activities. The results are consistent with the a priori hypothesis that there are three subgroups within occupational medicine: injury care, clinical subspecialist, and management/population health.

Limitations

These results reflect the participating population. The sample size may not fully represent the diversity of the field in terms of practice characteristics or geographic distribution. The CS subsample is smaller than the other two groups. A high proportion of the study volunteers were board certified or eligible in occupational medicine, although many practitioners in the field do not have such formal residency training. For example, board-certified physicians constitute only 42% of American College of Occupational and Environmental Medicine members.[1,12] The under representation of those without residency training is more likely to lead to underestimation rather than overestimation of differences among the three practice groups. For example, it is reasonable to hypothesize that board-certified physicians are more likely to value and have experience with toxicology, epidemiology, and OSHA than are those without such formal training.

As the OMP study progresses, a broader array of occupational physicians is being recruited to address these concerns. In the subsequent phases of the study, activity logs will provide information about actual activities in a manner that is theoretically less subject to any reporting biases.

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