Career Paths in Occupational Medicine

Philip Harber, MD, MPH, Johnny Bontemps, BS, Kaochoy Saechao, MD, MPH, Samantha Wu, BS, MS, Yihang Liu, MD, MS, and David Elashoff, PhD

Objective: To describe career path patterns for occupational medicine (OM) physicians. **Methods:** A convenience sample of 129 occupational physicians described work activities and locations at several career points up to 20 years ago, first OM position, and 10 years after expectations. **Results:** Clinical activities were important throughout (eg, 41% and 46% of occupational physicians reported frequently treating patients 20 years ago and currently). Practice locations changed more markedly, with increased multisite clinics and hospital/medical center-based practices. Performing mainly clinical activities in a first job increased from 82% to 97% over the past 20 years. Career transitions between clinical and nonclinical roles were common (40% of participants). Many anticipate transition to nonclinical work over 10 years. **Conclusions:** Activities have not fundamentally changed, but practice locations have evolved. Both clinical and management activities remain important, and path to managerial positions increasingly begins in clinical practice.

Occupational medicine (OM) is one of the preventive medicine specialties. It is a diverse field that includes clinical, managerial, and public health aspects.[1–5] The University of California, Los Angeles, Occupational Medicine Practice (OMP) research project has conducted an extensive study of practice locations, activities, and skills of current OM physicians. The study included questionnaires and up to 25 points in time-descriptive activity logs for each of the participating physicians. The OMP project is funded by the National Institute of Occupational Safety and Health. The study identified the patterns of professional activities and skills used.[6,7] The information from this large cross-sectional study may help to inform educational curriculum development, workforce needs assessment, and professional compensation policies.

This work extends our previous study, which was cross-sectional in nature.[6] This study employed a separate sample of OM physicians who described their activities over many years. This study also facilitates addressing many additional issues. For example, the cross-sectional study showed that career stage was a major determinant of the nature of practice activities, with physicians earlier in their careers more likely to be in predominately clinical roles.[6] Nevertheless, the cross-sectional nature of the OMP study precluded determining whether the impact of career stage reflected a fundamental change in the nature of the specialty or if there is a natural progression of activities over the course of a career. In addition, this study provides insight into overall changes in the field over the past two decades. In conclusion, the study considered the future expectations of current practitioners to determine if they are consistent with experience.

From the Community, Environment, and Policy Division (Dr Harber and Ms Wu), Mel and Enid Zuckerman College of Public Health, University of Arizona, Tucson, Occupational and Environmental Medicine Division (Drs Harber, Saechao, and Liu, and Ms Wu and Mr Bontemps), Department of Family Medicine, David Geffen School of Medicine at University of California at Los Angeles and Department of Medicine (Dr Elashoff), David Geffen School of Medicine at University of California at Los Angeles.

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Address correspondence to: Philip Harber, MD, MPH, Community-Environment, and Policy Division, Mel and Enid Zuckerman College of Public Health, University of Arizona, Medical Research Building—Room 112, 1656 E Mabel St, Tucson, AZ 85724 (pharber@email.arizona.edu).

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METHODS

The study was approved by the University of California, Los Angeles, institutional review board. Participants provided informed consent and received a small payment for participation. Physicians were eligible to participate if they practiced OM in the United States or Canada. Participants were recruited from e-mail requests, several annual conferences, and societies of OM professionals, including regional, national, and honorary organizations. The specific meetings were selected because they occurred within the subject recruitment time span.

Each participant completed a brief questionnaire in a printed version or on-line (Survey Monkey, Portland, OR). Each described his or her professional work at several time points: currently (T-0), 5 years ago (T-5), 10 years ago (T-10), and 20 years ago (T-20). For each time point, the physician answered three questions: whether practicing OM, main practice location, and frequency of specific activities. Each was also asked to project activities 10 years in the future on the basis of most likely rather than most desired activities (T+10). In addition, each physician described his or her first OM job and provided the year (excluding residency training). For most analyses, physicians not practicing OM at the time were excluded, but they were included in the future expectations analyses to account for retirement and career changes. Participants also indicated whether they were board-certified in OM, their sex, and medical school graduation year.

Career stage was defined according to the date of the first OM job in the following manner: late (<1990), mid (1990–1999), and early (2000–2010). (We used date of first OM job rather than graduation year because many physicians enter the field after pursuing other medical specialties.)

Practices of the participating physicians were characterized in two ways—main location and frequency of specific practice activities. Practice location describes where they work, with the following categories: private office/clinic, corporate/plant office, government/university, hospital/medical center, multisite clinic, and other. For some analyses, these were aggregated in two location groups: location-clinical included private office/clinic, hospital/medical center, and multisite clinic; location nonclinical included government/university, corporate/plant, and other. In the event they worked in multiple settings, physicians were asked to select the location where they work the most.

Practice activities included six categories: treatment, healthy worker examination, medical legal, management, research/public health, and other. A five-category rating scale was used to describe the frequency of each. Many physicians conducted multiple activities at each time; therefore, to simplify analyses, the scale was collapsed into "high frequency" (more than 50% time), "low-frequency" (less than 50% time), and "never" (0%). For some analyses, these were aggregated into two activity groups: clinical included treatment, healthy worker examination, and medical legal; nonclinical included management, research/public health, and other. A physician was considered "mainly clinical" if the sum of scores for clinical activities was

greater than or equal to the sum of scores for nonclinical activities. Otherwise, a physician was considered "mainly nonclinical."

Career transitions were determined for each participant at temporally contiguous times on the basis of whether their activities were mainly clinical (C) or mainly nonclinical (N). There were therefore four transition possibilities: NN, CC, NC, and CN. Physicians who were not working predominantly in OM at either of the adjacent times were excluded from the analysis. Thus, there were up to four times for transition: 20 to 10, 10 to 5, 5 to current, and current to future. In addition, the transition from first job to current job was also determined. Each physician was further characterized by whether there were any transitions or no transitions. Each was also characterized by whether there was ever a CN or NC transition in his or her career.

Data were managed using a confidential commercial Web service vendor (Survey Monkey, Portland, OR) for on-line collection, format transformations were carried out using Excel and Visual Basic for Applications (Microsoft, Redlands, WA), and data were stored in a relational database with added custom programs (Access and Visual Basic for Applications, Microsoft, Redlands, WA). Statistical analyses were performed with SAS for PC (Version 9.1, SAS Institute, Cary, NC). Graphic displays were prepared using Excel. Descriptive and hypothesis testing statistical analyses were conducted using chi-squared or Mantel-Haenzel tests if categories were ordered. Descriptive data are presented as overall prevalence estimates at each time point.

RESULTS

Characteristics of the 129 participants are summarized in Table 1. The sample included physicians at multiple career stages. The sample includes a high proportion (70%) of OM board-certified physicians. Participants graduated from medical school on an average of 26.9 years previously (SD = 10.4 years; range = 1960–2007) and had their first OM job on an average of 18.8 years previously (SD = 10.8 years; range 1962–2010). Career stage and board-certification status did not differ significantly according to sex. The more-senior physicians in this sample were more likely to be board-certified than those in earlier career stages. This may indicate that board-certified physicians are more likely to remain in the profession or that those entering the field recently are less likely to have been formally residency trained. Nevertheless, this finding may be a reflection of the subject recruitment patterns.

Temporal Trends

The distribution of main practice location for each of the times is summarized in Table 2. The relative proportion of clinical and nonclinical locations was largely unchanged over the past 20 years. Nevertheless, the specific locations changed over time ($P < 0.01$). There was a progressive increase in the proportion of physicians working in hospitals/medical centers and multisite clinics accompanied by a decrease in the proportion in private offices/clinics.

Table 3 shows comparable results for specific activities. Clinical activity such as treating injured/ill patients has been important throughout all the times (eg, 41% of physicians practicing 20 years ago reported high frequency of such activity and 46% of those practicing now did so).

For management activities, there was a decrease over time in the proportion of physicians who reported they never did this activity. There was a statistically significant increase in the proportion of physicians whose activity category was mainly nonclinical. This may reflect a change in the field itself, but is more likely because of career progression of those who were in the field 20 years ago and are still practicing.

First Job

Characteristics of the first job held are described in Tables 4 and 5 according to the epoch during which they entered the field. More-recent graduates are much more likely than their predecessors to begin practicing in a clinical role. Having a first job in any corporate/plant office position declined from 26% to 3% and 9% in the subsequent epochs. Initial work in clinically oriented ("mainly clinical") locations was common at all entry dates, but increased from 55% to 79% over the past 20 years ($P < 0.01$).

Clinical activities were predominant at all times reported; however, there has been a significant decrease in the proportion of physicians whose initial job activities are predominately nonclinical (from 18% in the late-career-stage physicians to 3% of the more-recent graduates). Conversely, there was also an increase in the proportion of high frequency of treatment activities. In addition, board-certification status did not seem to have a significant effect. Practice locations of the initial job reflected the overall distribution of locations.

Career Transitions

Career transitions are summarized in Table 6. Although the majority of participating physicians reported no career transitions, 40% of participants had at least one major transition. More than half of the late-career-stage physicians, who had at least 20 years of practice in the specialty, had a major transition. Transitions from clinical to nonclinical (CN) activities were considerably more common than the other direction (NC). Only 6% of late-career participants (4 of 65) had only NC transitions. Nevertheless, a significant proportion had transitions in both directions; whereas 24% reported having only a CN, 12% (six physicians) reported both types. Both the frequency and pattern of transitions were similar for board-certified and noncertified physicians. Logistic regression analyses showed that board certification was not statistically significantly associated with the type or likelihood of a transition, when adjusted for length of practice (data not shown).

The characteristics of the first job are statistically associated with subsequent activities. As seen in Table 5, most physicians' current general practice location and main activity categories are the same as in their initial position. Although only a minority start in nonclinical locations or initially have mainly nonclinical activities, such physicians are more likely to currently be in such roles.

Future Expectations

Expectations of future practice locations and activities are summarized in Tables 7 and 8; they are also described according to career stage, board-certification status, and current location or activity category. Among the late-career-stage physicians, many (51%) expected to be in an "other" location in 10 years. (This may be due to anticipated retirement.) Of those currently working in a nonclinical location, very few expect to be transitioning to a clinical location in the future (only 2 of 50), whereas 34% currently in clinical locations anticipate moving to nonclinical locations (possibly including limited work during retirement). Conversely, when describing anticipated future activities, both types of transitions were expected by many participants (34% CN, 25% NC). Board-certified physicians were less likely to anticipate a high frequency of direct patient treatment activities than noncertified physicians ($P < 0.05$).

DISCUSSION

This study extends the earlier University of California, Los Angeles, OMP research project, which provided an empirical cross-sectional description of what occupational preventive medicine physicians actually do and what skills they use.[6,7] The current career transitions study invited occupational physicians to retrospectively describe their work activities over much of their career in a highly standardized format. This provided longitudinal information about

TABLE 1. Characteristics of Participants

	Overall		Career Stage: Late		Mid		Early			
	N	%	*n*	%	*n*	%	*n*	%	*P* (CS)	*P*(MH)
Overall	129	100	65	50	30	23	34	26		
Sex										
Male	90	70	50	77	17	57	23	68	NS	NS
Female	39	30	15	23	13	43	11	32		
OEM certified										
Yes	90	70	52	80	19	63	19	56	**	***
No	39	30	13	20	11	37	15	44		

Characteristics of participants are summarized. OEM certification refers to board certification in occupational medicine. Career stage is defined in the Methods section. *$P < 0.1$; **$P < 0.05$; ***$P < 0.01$.

CS, chi-squared test; MH, Mantel-Haenszel test; NS, not significant; OEM, occupational and environmental medicine.

TABLE 2. Temporal Trends—Locations

	Time, 20 Yrs Ago (1990) (*n* = 75)		Time, 10 Yrs Ago (2000) (*n* = 95)		Time, 5 Yrs Ago (2005) (*n* = 109)		Time, Current Yr (2010) (*n* = 129)		*P*(CS)	*P*(MH)
Location	*n*	%	*n*	%	*n*	%	*n*	%		
Private clinic/office	27	36	25	26	27	25	27	21	NS	**
Corporate/plant office	15	20	16	17	14	13	17	13		
Government/university	12	16	20	21	21	19	20	16		
Hospital/medical center	5	7	10	11	16	15	24	19		
Multisite	10	13	17	18	21	19	28	22		
Other	6	8	7	7	10	9	13	10		
Location category										
Mainly clinical	42	56	52	55	64	59	79	61	NS	NS
Mainly nonclinical	33	44	43	45	45	41	50	39		

Practice location frequencies by time are summarized. Results are on the basis of physicians in practice at the time and completing the item.
*$P < 0.1$; **$P < 0.05$; ***$P < 0.01$.

CS, chi-squared test; HealthEx, examining healthy workers; MH, Mantel-Haenszel test; NS, not significant. Mainly clinical and mainly nonclinical are summary measures defined in the Methods section.

TABLE 3. Temporal Trends—Activities

	Time, 20 Yrs Ago (1990)			Time, 10 Yrs Ago (2000)			Time, 5 Yrs ago (2005)			Time, Current Yr (2010)			*P*(CS)	*P*(MH)
Activities	Never	Low	High	Never	Low	High	Never	Low	High	Never	Low	High		
Treat	12%	47%	41%	16%	46%	39%	17%	36%	48%	17%	37%	46%	**	**
HealthEx	14%	65%	22%	21%	56%	23%	17%	59%	24%	21%	62%	17%	NS	NS
MedLeg	50%	46%	4%	45%	50%	5%	42%	50%	7%	47%	46%	8%	NS	NS
Manage	24%	53%	23%	23%	49%	28%	19%	54%	27%	19%	48%	33%	+	+
ResPub	61%	34%	5%	56%	38%	6%	63%	35%	3%	62%	34%	4%	NS	*
Other	49%	44%	7%	49%	46%	5%	42%	52%	6%	43%	49%	8%	*	NS
Activities category		*n*	%		*n*	%		*n*	%		*n*	%		
Mainly clinical		58	77		64	67		72	66		74	57	**	***
Mainly nonclinical		17	23		31	33		37	34		55	43		

Practice activity frequencies by time are summarized. Results are on the basis of physicians in practice at the time and completing the item. *$P < 0.1$; **$P < 0.05$; ***$P < 0.01$; +, $P < 0.10$.

CS, chi-squared test; HealthEx, examining healthy workers; MedLeg, medical-legal; MH, Mantel-Haenszel test; NS, not significant; ResPub, research/public health; Treat, treating injured/ill patients. Mainly clinical and mainly nonclinical are summary measures defined in the Methods section.

TABLE 4. First Job Characteristics—By Epoch

	Overall ($N = 129$)		Epoch							
			<1990 ($n = 65$)		1990–1999 ($n = 30$)		2000–2010 ($n = 34$)		P(CS)	P(MH)
Location	n	%	n	%	n	%	n	%	***	***
Private clinic/office	44	34	22	34	14	47	8	24		
Corporate/plant office	21	16	17	26	1	3	3	9		
Government/university	15	12	9	14	3	10	3	9		
Hospital/medical center	20	16	7	11	3	10	10	29		
Multisite	25	19	7	11	9	30	9	26		
Other	4	3	3	5	0	0	1	3		
Mainly clinical	89	69	36	55	26	87	27	79	***	***
Mainly nonclinical	40	31	29	45	4	13	7	21		
Activities (high frequency)										
Treat	86	67	32	49	26	87	28	82	***	***
HealthEx	33	26	16	25	9	30	8	24	NS	NS
MedLeg	7	5	2	3	4	13	1	3	NS	NS
Manage	13	10	7	11	4	13	2	6	*	*
ResPub	6	5	4	6	2	7	0	0	NS	**
Other	5	4	1	2	3	10	1	3	**	NS
Mainly clinical	113	88	53	82	27	90	33	97	*	**
Mainly nonclinical	16	12	12	18	3	10	1	3		

Characteristics of the participants' first job by epoch are shown.
*$P < 0.1$; **$P < 0.05$; ***$P < 0.01$.
CS, chi-squared test; HealthEx, examining healthy workers; MedLeg, medical-legal; MH, Mantel-Haenszel test; NS, not significant; ResPub, research/public health; Treat, treating injured/ill patients.

TABLE 5. First Job Characteristics—By Current Practice

		Clinical		Nonclinical		P(CS)
Current location ($n = 129$)		n	%	n	%	
First job location	Clinical	65	73	24	27	***
	Nonclinical	14	35	26	65	
Current activities ($n = 129$)						
First job activities	Clinical	84	74	29	26	***
	Nonclinical	4	25	12	75	

Characteristics of the participants' first job by current practice location and activities are shown.
*$P < 0.1$; **$P < 0.05$; ***$P < 0.01$.
CS, chi-squared test.

career paths and also gave insight into evolution of the field over the past 20 years and future changes. The data complement other surveys and expert opinion reports about the field.[8–11]

Has the Field Changed?

The empirical data of this study and the OMP cross-sectional study confirm that OM continues to be a hybrid of clinical and nonclinical work as reflected in both practice settings and practice activities. There were notable changes in practice location. For example, there has been considerable growth in practice locations in hospitals/medical centers and in multisite OM clinics and concomitant reduction in corporate settings. The reduction of small private practices in OM is consistent with general trends in medicine and with a survey of American College of Occupational and Environmental Medicine (ACOEM) members.[9]

The data demonstrate that the specialty continues to incorporate both population medicine and clinical components and is not only focused in workers compensation injury care. Clinical activities were important in the past and continue to be so now. (Tables 3 to 5.)

Management also continues to be important. The data concerning recent entrants show that although nearly all now start in clinical roles (Tables 4 and 5), many expect to expand their managerial activities as their career progresses (Tables 7 and 8).

There may be future changes that are not reflected in this study. For example, the aging of the OM workforce and the general American workforce may lead to changes in areas of emphasis and in the availability of occupational physicians.

Reasonable Expectations for Physicians Entering the Field

Entry-level OM job activities are now more often clinical than 20 years ago. Opportunities for entry-level OM jobs in corporate settings/plant offices are considerably less frequent than in the past. New physicians should expect to work in predominantly clinical settings

TABLE 6. Career Transitions

	Overall		Career Stage					OEM Certified			
			Late	Mid	Early	*P*(CS)	*P*(MH)	Yes	No	*P*(CS)	*P*(MH)
n	129	65	30	34			90	39			
Lifetime transitions											
Ever-transition	51	40%	52%	23%	29%	**	***	42%	33%	NS	NS
Never-transition	78	60%	48%	77%	71%			58%	67%		
Ever-CN	47	36%	46%	23%	29%	*	**	39%	31%	NS	NS
Ever-NC	20	16%	29%	3%	0%	***	***	19%	8%	NS	NS
Transitions patterns											
Both CN and NC	16	12%	23%	3%	0%	***	***	16%	5%	NS	NS
CN-only	31	24%	23%	20%	29%			23%	26%		
NC-only	4	3%	6%	0%	0%			3%	3%		
Never-transition	78	60%	48%	77%	71%			58%	67%		

Patterns of lifetime career transitions according to career stage and certification status are summarized. Transitions considered were: NC, nonclinical to clinical; CN, clinical to nonclinical (based on main activity variable).

*$P < 0.1$; **$P < 0.05$; ***$P < 0.01$.

CS, chi-squared test; MH, Mantel-Haenszel test; NS, not significant; OEM, occupational and environmental medicine.

TABLE 7. Future Expectations (10 Years)—By Career Stage and Certification Status

	Overall	Career Stage				OEM Certified		
		Late	Mid	Early	*P*(MH)	Yes	No	*P*(CS)
By Career Stage and Certification Status								
Locations, *n*	129	65	30	34		90	39	
Private clinic/office	16%	15%	27%	9%	***	13%	23%	***
Corporate/plant office	13%	8%	13%	24%		13%	13%	
Government/university	12%	11%	20%	9%		17%	3%	
Hospital/medical center	10%	6%	3%	24%		12%	5%	
Multisite	16%	9%	13%	29%		9%	31%	
Other	33%	51%	23%	6%		36%	26%	
Activities (high frequency), *n*	115	57	26	32		81	34	
Treat	23%	11%	35%	34%	***	19%	32%	*
HealthEx	11%	9%	15%	13%	***	11%	12%	NS
MedLeg	11%	9%	16%	10%	NS	13%	6%	**
Manage	32%	32%	19%	42%	NS	30%	35%	NS
ResPub	8%	7%	12%	6%	NS	10%	3%	***
Other	8%	7%	8%	11%	NS	8%	9%	NS

Expected (10 years) practice locations and activities by career stage and board certification are shown. *$P < 0.1$; **$P < 0.05$; ***$P < 0.01$.

CS, chi-squared test; HealthEx, examining healthy workers; MedLeg, medical-legal; MH, Mantel-Haenszel test; NS, not significant; OEM, occupational and environmental medicine; ResPub, research/public health; Treat, treating injured/ill patients.

and do predominantly clinical work. There are fewer opportunities to begin an OM career in managerial positions and to start at a corporate location. Among late-career physicians, who entered the field on the average more than 20 years ago, 18% had mainly nonclinical activities in their first job. Among recent graduates currently in their early-career stage, only 3% started by performing mainly nonclinical activities. The proportion initially working in a corporate setting was 26% for late-career physicians but only 9% for early-career physicians.

Career Paths

This study considered if there are two distinct career pathways in the field—one consisting of clinical care of work-related injuries, particularly musculoskeletal disorders, and the other dealing with managerial activities. If so, each physician's formal residency education and lifelong learning should be focused on one of the areas. Our longitudinal career path data demonstrate that actually there are frequent transitions from clinical to nonclinical activities, and therefore the well-qualified occupational physician must be competent in both realms. Notably, only 1 of the 10 "core competencies" identified by ACOEM is predominantly clinical.[1] Overall, 40% had at least one major career transition. This probably underestimates the proportion of physicians who will have at least one transition during their career because it includes many physicians early in their careers. More than half of the late-career physicians had at least one such transition. A transition from clinical to nonclinical work was more likely than

TABLE 8. Future Expectations (10 Years)—By Current Work

		Clinical		Nonclinical		*P*(CS)
Future location ($N = 129$)		*n*	%	*n*	%	
Current location	Clinical	52	66	27	34	***
	Nonclinical	2	4	48	96	
Future activities ($N = 114$)						
Current activities	Clinical	59	75	20	25	***
	Nonclinical	12	34	23	66	

Expected (10 years) practice locations and activities by current practice are shown.

*$P < 0.1$; **$P < 0.05$; ***$P < 0.01$.

CS, chi-squared test.

a change from predominately nonclinical to clinical, although 16% underwent bidirectional changes.

Pathway to Managerial/Population Medicine Positions

Many occupational physicians are deeply involved with managerial activities. In their most recent work, 41 (32%) of occupational physicians were mainly nonclinical in their activities. Furthermore, many anticipate shifting from predominantly clinical to predominately nonclinical work in 10 years; of those currently in predominantly clinical positions, 34% anticipate moving to predominately nonclinical settings (Tables 7 and 8).

The data show that the pathway to a managerial position increasingly begins with clinical activity. Despite the interest in nonclinical activities (eg, managerial/population medicine), most physicians begin their OM careers as clinicians. As shown in Tables 4 and 5, 88% of occupational physicians began their work in predominantly clinical activity jobs. This trend has increased, so that those 97% of those entering the field recently began in a clinical setting. Nevertheless, there are significant opportunities for changing from a clinical to nonclinical (eg, managerial) position over time. Most physicians whose current activities are mainly nonclinical began with mainly clinical activities (29 of 41).

Implications for Residency Training and Lifelong Learning

The results of this study reinforce the conclusion of the earlier of OMP analyses,[6,7] other studies,[9,12] and certifying organizations[2,3,13,14] that well-trained occupational physicians require competency in *both* clinical and managerial aspects. The ACOEM competencies statement suggests that physicians should be competent in each of the 10 areas.[1] Educators should therefore prepare new residency graduates both for their first job, which is likely to be clinical, and for managerial/population-oriented activities that are likely to be important as their careers progress.

Limitations

The participating physicians were in a convenience sample and may incompletely represent all physicians providing service to workers. For example, the proportion of OM board-certified physicians in this study (70%) is higher than the proportion of OM board-certified members of the ACOEM.[9] In addition, because many of the study participants were recruited at professional meetings, less professionally motivated occupational physicians may be underrepresented. Therefore, these results should be considered applicable predominantly to those physicians who have demonstrated commitment to OM as a profession. The findings may not apply to some physicians providing basic occupational injury care services.

The sample also includes a high proportion of physicians who have been in the field for over 20 years. This may constitute a "survivor bias" because those who were unsuccessful or disliked the work would have left. It is possible that the field may be even more clinical than reflected in this study because "frontline clinicians" may be less likely to be board-certified or attend professional organizational meetings.

The study provides useful new information about the nature of the field. It also could provide guidance to physicians newly entering the field and to those responsible for their education.

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