

## SURGICAL SPECIALIZATION IN A LIMITED HEALTH CARE PROFESSION: COUNTERVAILING FORCES SHAPING HEALTH CARE DELIVERY

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### ABSTRACT

This study investigated correlates of surgical specialization among a group of non-physician specialists—podiatrists. Placed in the context of a countervailing powers perspective, we investigate one research question not previously examined among a group of limited-health professionals: Is the current work environment of podiatrists (e.g., practice locations, work in a hospital, physician referrals), as compared to their prior education and sociodemographic characteristics, more likely to be associated with surgical specialization? Results show that respondents who practiced in more than one office location, who made referrals to endocrinologists, and who had full medical-staff privileges in a hospital had the greatest likelihood of claiming specialization in surgery. Implications of the findings are discussed in terms of how developments in podiatry are related to a reconfiguration of health care delivery by involving podiatrists increasingly with the traditional work and authority of physicians.

### INTRODUCTION

Recent sociology of medicine research has reported on the importance of a new theoretical perspective, that of countervailing powers, in order to better understand professional dynamics that include the interrelationships among established medicine and limited-medical professions (e.g., podiatric medicine) (Abbott 1988; Hafferty, Light 1995; Halpern 1992). The countervailing powers perspective suggests that established medicine is shaped by

the particular configuration of countervailing institutional powers, and all within a framework of professional dynamics that includes professional ascension as well as professional maintenance and professional decline. (Hafferty, Light 1995)

Consideration of the countervailing powers perspective has been a redirection of both professional work in cross-profession arenas and jurisdictional control that determines how such cross-profession domains may be changing and delimiting the traditional authority of established medicine (Hafferty, Light 1995; Halpern 1992). From a variety of institutions and groups, countervailing pressures have eroded physicians' hegemony. These countervailing pressures include, but are not limited to, demographic changes and significant changes in reimbursements for services, managed care arrangements, and the increased role of other health care occupations in treatment networks with physicians (Chumbler, Grimm 1994, 1995; Hafferty, Light 1995).

The term "managed care" is used generically to describe all types of integrated health care delivery systems, such as health

maintenance organizations (HMOs) and preferred provider organizations (PPOs), that provide cost-conscious motivations for how and why care is to be delivered (Wirth, Allcorn 1993). In the past, the health care industry operated on a fee-for-service model where patients solicited care on their own, using physicians they wanted. Once selected, the physician was completely autonomous in providing whatever care patients desired (Ferraro 1993; Wirth, Allcorn 1993). Now, HMOs extend

contractual responsibility for care to a voluntarily enrolled, defined population in exchange for a fixed annual or monthly fee independent of use of services. (Ferraro 1993)

Under various HMO plans, primary care physicians (physicians who specialize in either family practice, general internal medicine, or general pediatrics) have more power relative to physician specialists, by controlling and monitoring patient referrals to specialists (Wirth, Allcorn 1993; Xu, Veloski, Hojat, Fields 1995). Therefore, in the context of contemporary management of patient referrals, primary care physicians are often called "gatekeepers."

HMOs perform the dual function of being both the insurer and the provider of health care (Ferraro 1993; Wirth, Allcorn 1993). Over 15 percent of the U.S. population (36,482,090) were enrolled in HMOs by July 1991 (Ferraro 1993; MacLeod 1993). This fundamental change—from the traditional fee-for-service care model to the pre-paid group model—has given expanded roles to some health care occupations and also diminished the degree to which physicians dominate the jurisdictional control of health care (Ferraro 1993; Hafferty,

Light 1995).

Previous studies have presented historical evidence suggesting that physicians have lost some of their autonomous control over their anatomical areas of expertise (Abbott 1988; Halpern 1992). Results of such studies suggest that more power is lost when common work takes place in large, multi-field organizations such as hospitals (Abbott 1988; Wirth, Allcorn 1993). Conversely, less power is lost to limited medical professions if they have the exclusive control of work and if medicine has the exclusive source of supervisory control over challenging groups (Halpern 1992). Therefore, past research has focused on aspects of medicine in relation to worksites as key issues in determining the amount of jurisdictional authority lost to or shared with groups seeking increased jurisdictional control over work shared with physicians (Hafferty, Light 1995).

However, what continues to be missing from the literature is information on the

changing nature of medical work as it is re-configured across the various health occupations....Like medicine, other health occupations are becoming highly stratified. (Hafferty, Light 1995)

To fill an important void in the literature on stratification among health occupations, the present study shifts the focus from jurisdictional resolution of cross-profession work in health care settings (Hafferty, Light 1995) to an examination of a group of podiatrists, foot specialists who are not physicians, but have characteristics of practice similar to them (Skipper, Hughes 1983).

### Countervailing Forces within Podiatry

Podiatrists are trained at colleges of podiatric medicine and from a curriculum that is very similar to those of medical schools (Helfand 1987). Podiatrists typically treat types of "foot problems for which physicians, in general, have not been particularly inclined to show special interest" (Skipper, Hughes 1983). For instance, podiatrists are likely to treat minor foot ailments (such as corns, calluses, and bunions) (Wylie-Rosett, Walker, Shamon, Engel, Basch, Zybert 1995). Nevertheless, podiatrists have not obtained full autonomy over the foot. For instance, physicians rather than podiatrists have the authority to amputate the foot (Skipper, Hughes 1983). However, like primary care physicians, podiatrists perform a

vital role in the health care delivery system because many ailments of the feet are considered a significant health problem patients regularly seek initial treatment from podiatrists (Skipper, Hughes 1983; Wylie-Rosett et al 1995).

Podiatrists also can perform a gate-keeper role by detecting severe conditions, especially with diabetics, and by making referrals to physicians (Chumbler, Grimm 1995). The Centers for Disease Control and Prevention recommended that the feet of diabetic patients should be examined at every visit to a provider (Wylie-Rosett et al 1995). When treating the foot-related ailments of diabetics, especially those who are over age 65, podiatrists are common sources of referrals to endocrinologists, medical sub-specialists who diagnose and treat individuals with diabetes. In 1992, fourteen million Americans had diabetes, and 55,000 of them had lower-limb amputations. Research suggests that 50 percent of these amputations would have been preventable based upon early detection by means of examinations and treatments provided by podiatrists (Wylie-Rosett et al 1995).

In the context of managed health care provision, the present study does not imply that podiatrists have obtained full autonomy over their anatomical area of expertise, or that they have more authority to treat foot ailments than physicians. However, in this era of cost-conscious and managed provision of care, we are studying podiatry as an excellent example of a field which is becoming an alternative source of treatment that could be, but is not provided by physicians (Chumbler, Grimm 1995; Hafferty, Light 1995). More specifically, the present study is primarily focused on exploring the characteristics of podiatrists who claim specialization in surgery. Podiatric surgical activity, especially as it takes place more in hospitals, is considered to be a key countervailing force which has impacted and will continue to impact the traditional hegemony of physicians (Levrio 1987, 1992).

In the analysis presented below we shift the major sources of evidence of countervailing forces that reduce the hegemony of physicians from historical records of professional associations (Abbott 1988) and litigation records or other legal data (Halpern 1992) to self-reported characteristics of practitioners' educational/professional training, their sociodemographic backgrounds and their practice environments. Such data are a rich, yet under-utilized, source

of information on the rapidly increased role of providers other than physicians (Hafferty, Light 1995).

### **Surgical Specialization within Podiatry**

The emergence of a formally recognized surgical specialization within podiatric medicine has been a slow, arduous process, resulting in multi-option training (Chumbler, Grimm 1995; Levrio 1992). The podiatrists who specialize in surgery either have hospital residency training and certification in podiatric medical surgery (Grimm, Chumbler 1995), or they have performed a preceptorship under the direction of a certified podiatric surgeon (Levrio 1987, 1992). Another difference between podiatrists who specialize in surgery and physicians who specialize in surgery, centers around practice structure. Being surgically specialized in podiatric medicine does not mean full-time specialization; it is not uncommon for podiatrists to actively participate in surgeries and also provide primary podiatric care for a variety of common foot ailments. Given that surgical specialization among podiatrists is difficult to establish through objective criteria related to preparation for actual practice activity, in this study we use a self-reported item representing podiatrists affirming the predominant role of surgery in their practices.

Trends within podiatry that also may be related to podiatrists' propensity to specialize in surgery are the advancement of educational and professional training within podiatry and podiatrists' expanded surgical activity gained through staff privileges in hospitals (Grimm, Chumbler 1995). By the 1980s, approximately 75 percent of podiatrists practicing in the Chicago Metropolitan Statistical Area—the location of the study sample—had gained some type of hospital medical staff privileges. Previous studies found certain sociodemographic traits of podiatrists such as their age and gender to be related to surgical specialization in podiatry. For instance, as compared to male podiatrists, females were less likely to report surgical activity in their private practices (Chumbler, Grimm 1993). Other research has found that relatively younger podiatrists (those 40 years of age or younger) were more likely to have completed surgical residency training and less likely to refer surgical cases to other podiatrists (Grimm, Chumbler 1995). Past research also demonstrated that in comparison to Caucasian podiatrists, African

Americans were less likely to have completed surgical residencies (Chumbler, Grimm 1994).

Certain aspects of podiatric medical practice also may be key components of the countervailing forces within podiatry that are confronting the traditional scope of physicians' traditional practice activity and power. Abbott (1988) argued that when different health care occupations perform similar work in common work settings (e.g., hospitals and large clinics) cross-field accommodations called "systems of professions" develop. Thus, structural aspects of podiatric medical practice that could be important elements of countervailing forces of surgical practice activity include: 1) number of office locations, including clinics, hospitals & group practices; 2) hospital staff privileges; and 3) the amount of hospital practice activity.

The present study also examines the referrals made by podiatrists to three types of physician specialists, pediatricians, orthopedists, and endocrinologists. These three specialists represent common destinations of patient referrals from podiatrists in specific configurations of treatment sequences. Foot problems related to infants and children are common. So common, that a sub-specialty, pedo-podiatry, has emerged to treat some foot ailments of infants, children and adolescents. However, pediatricians still treat most foot problems of children and therefore receive frequent referrals from podiatrists (Helfand 1987). Orthopedists receive many referrals from podiatrists, since they perform many foot surgeries, especially those dealing with severe bone fractures of the foot and ankle (Weiner, Steinwachs, Frank, Schwartz 1987). Likewise, endocrinologists receive many referrals from podiatrists because podiatrists are the first and often continue to be the most frequently seen provider of treatments for foot ailments related to diabetes (Helfand 1987).

To better understand the role of podiatry in the expanded and more complicated hierarchy of power and professional activity of health care providers suggested by the countervailing forces perspective, we provide the needed information recently called for by Hafferty and Light (1995). They call for the need for determining whether aspects of work settings or prior socialization (training and certification) are more important in determining the realignments of professional activity and professional allegiances. Additionally, previous research on physicians emphasized the influence of work settings rather than medical

training to explain professional activity and orientations (Abbott 1988; Freidson 1970a, 1970b; Wolinsky 1988). However, little remains known about the relative importance of these factors in alternative providers, particularly podiatrists.

Based on the literature discussed above, we investigate the following research question:

- 1) Does the current work environment of podiatrists (e.g., practice locations, work in a hospital, patient referrals to physicians) or the prior education/professional training and sociodemographic characteristics of podiatrists more likely to be correlated with surgical specialization?

## METHOD

### Sample

Questionnaires were mailed to a fifty percent sample (N=280) of all podiatrists practicing in the Chicago Metropolitan Statistical Area (MSA), during March 1991. One hundred sixty-eight completed questionnaires were returned, yielding a response rate of 60.0 percent. The sampling frame contained a list of the names, addresses, and phone numbers of all podiatrists practicing in the Chicago MSA. The names of podiatrists that had the Chicago school of podiatric medicine as their primary practice location were deleted from the sampling frame. This was done to derive a sample of respondents practicing primarily in the non-academic community. The Illinois Podiatric Medical Association (IPMA) provided the authors with the sampling frame, only 10 days old at the time of receipt.

The study sample was compared to two other samples, a regional sample of Chicago MSA podiatrists conducted by the Illinois Podiatric Medical Association (IPMA 1987) and a national sample (Skipper, Pippert 1985), to determine its representativeness. Five distributions were compared across all three samples, using the Chi-square goodness-of-fit test ( $p < .05$ ): 1) gender; 2) age; 3) proportion in group practices; 4) proportion on hospital medical staffs; and 5) the duration of residency training. The study sample had a larger proportion of female respondents. Otherwise, the differences between the study sample, the IPMA regional sample, and the national sample were not statistically significant (Chumbler, Grimm 1993).

## Measurement

### *Surgical Specialization*

We assessed podiatrists' surgical specialization with a binary variable that contrasts respondents who describe their practice as surgically specialized (scored 1) with those who do not describe it (scored 0). Approximately 58 percent of the respondents described their practice as being surgically specialized.

### *Sociodemographic and Educational/Professional Training*

We employed three sociodemographic variables: age (years); race (1=white); and gender (1=male). We used three educational/professional training indicators that reflect the training and credentials of respondents: residency training (1=yes); length of residency training for those with it (years); and national certification in surgery (1=yes). A majority of the study sample were male (83%), white (90%), and neither residency trained (51%), nor nationally certified in surgery (70%). Ages of respondents ranged from 25 to 78, with a mean of 42.2 years (median=39.00) and a standard deviation (SD) of 11.79 years. The length of residency training ranged from one to four years, with a mean of 1.5 years (median=1.00, SD=.81 years).

### *Professional Practice Characteristics*

The professional practice settings of podiatrists were measured by four dichotomous variables: solo practice (1=yes); number of office locations (1=two or more); length at current office location (1=11 or more years); and location of practice within the Chicago MSA (1=suburbs and outlying communities or outside of city). Approximately three-fourths (74%) of respondents were in solo practices, slightly over one-half (52%) indicated two or more office locations, over one-third (37%) had practiced 11 or more years at the current location(s), and 64 percent practiced either in the suburbs and/or outlying communities.

### *Referrals to Physicians and Hospital Orientation*

Respondents were queried about whether they made at least one patient referral within the past four weeks to the following physician specialists: pediatricians (1=yes), orthopedic surgeons (1=yes), and endocrinologists (1=yes). One-third of the respondents reported practicing referrals to pediatricians,

**Table 1: Logistic Regression Results of Characteristics on the Likelihood of Podiatrists' Surgical Specialization**

Independent Variables	Logistic Coefficient/ Standard Error	Odds Ratio
<b>Sociodemographic</b>		
Age	-.02/.03	.98
White	.40/.64	1.50
Male	.54/.49	1.72
<b>Educational/Professional Training</b>		
Residency	.43/.63	1.54
Length of Residency	.32/.29	1.37
Surgical Certification	.79/.48	2.20
<b>Professional Practice</b>		
Solo Practice	-.03/.45	.97
Number of Office Locations	1.17/.39**	3.21
Length at Current Location	.19/.19	1.20
Practice Outside City	-.03/.43	.98
<b>Referrals to Physicians</b>		
Pediatricians	.15/.43	.98
Orthopedic Surgeons	-.25/.49	.78
Endocrinologists	1.30/.45**	3.66
<b>Hospital Orientation</b>		
Number of Hrs/Wk Practiced in Hospitals	-.01/.03	.99
Full Medical Staff Privileges in a Hospital	1.02/.47*	2.76
Intercept	-2.57	
N	167	
Model x-squared/df	48.68/15	
Dep. var. mean	.58	
Pseudo R-squared	.226	

\*p<.05; \*\*p<.01

three-fourths made referrals to endocrinologists, and 79 percent reported referrals to orthopedic surgeons. Hospital practice activities of podiatrists were assessed by the number of hours practiced in hospitals (hours/week), and whether the respondent possessed full medical-staff privileges in a hospital (1=yes). Nearly two-thirds (64%) of respondents spent no hours per week in the hospital. Of those who did, the average number of hours per week was five (median = 3.00, SD = 7.54 hours). A majority (71%) of respondents reported full medical-staff privileges in hospitals.

### Multivariate Analysis

Since the dependent variable—surgical specialization—is dichotomous, the appropriate multivariate analytic technique is logistic

regression. In logistic regression the dependent variable is the natural log of the odds of a given response category (Hosmer, Lemeshow 1989). The log odds can be transformed into odds ratios, or exponentiated regression coefficients, allowing for an easier form of interpretation. The odds ratio (OR) represents the relative change in the odds of specializing in surgery given one-unit increase in the independent variable, adjusting for all other variables. To show how well the model fits the data, we report the model chi-square and the pseudo R<sup>2</sup>, a descriptive measure that is a rough estimate of the variation in surgical specialization accounted for by the independent variables (Knoke, Borhnstedt 1994). The independent variables were force selected into the logistic regression model. We used the listwise deletion procedure for missing data. Remarkably, only one case was deleted due to missing data. Therefore, the final sample size for the multivariate analysis was 167.

We performed several diagnostic tests in order to assess whether or not our results satisfied regression assumptions. For instance, we screened for multivariate outliers and found no meaningful violations that affected the descriptive statistics. Second, we found that the residuals met the assumptions of linearity, normality, and homoscedasticity. Third, we found weak collinearity, yielding confidence in the precision of the beta coefficients. Specifically, investigation of variance inflation factors (VIFs) for all the independent variables were less than 1.7, while most were around 1.0. VIFs greater than 10 are considered an indication of bias (Neter, Wasserman, Kutner 1990).

### RESULTS

Table 1 presents the logistic regression model, with podiatric surgical specialization as the dependent variable. Results in Table 1 include the unstandardized logistic regression coefficients, followed by standard errors, odds ratios, and significant p-values indicated by means of asterisks.

Results indicate that, net of the estimated effects of the sociodemographic, educational/professional training, professional practice, referrals to physicians, and hospital orientation characteristics, the following three variables (with their respective odds ratio in parentheses) had significant associations with self-reported surgical specialization among the podiatrists we studied:

- 1) practicing in two or more office locations (odds ratio = 3.21,  $p < .01$ );
- 2) making at least one patient referral to an endocrinologist four weeks prior to the study (odds ratio = 3.66,  $p < .01$ ); and
- 3) holding full medical-staff privileges in a hospital (odds ratio = 2.76,  $p < .05$ ).

A fourth variable, national certification in surgery, approached statistical significance at  $p < .05$ . More specifically, respondents who were surgically certified were two times more likely ( $p = .08$ ) to be surgically specialized, as compared to those without such certification. Collectively, all 15 independent variables accounted for a significant, albeit a modest, proportion of variance explained in surgical specialization (pseudo  $R^2 = .226$ ).

## DISCUSSION

Surgery has played a key role in enhancing the roles of podiatrists in health care as well as expanding their training for contemporary practice activity (Grimm, Chumbler 1995; Levrio 1987, 1992). Understanding what aspects of podiatrists' training for and involvement in surgical specialization helps explain the important changes in podiatry which have impacted the traditional authority and practice activities of physicians (Hafferty, Light 1995).

Results of our multivariate analysis show that neither the sociodemographic background (age, gender, and race) or professional training (completion of a residency) were associated with respondents' surgical specialization. Present results fail to support previous research that indicated men were more likely than women to declare surgical specialization in podiatry.

The finding that surgical certification was correlated with surgical specialization runs contrary to notion that practice environments are more important than sociodemographic and educational/professional training characteristics. We should point out that this finding approached statistical significance and was not significant at the customary level of  $p < .05$ . In the years to come, surgical certification may emerge as a stronger correlate of surgical specialization because other research has shown that surgical specialization yields more patient referrals from other podiatrists (Grimm, Chumbler 1995). Certification in surgery may underlie patterns of patient referrals among podiatrists which result in the existence of a surgically-based specialty in

podiatry. Therefore, credentials appear to play a key role in the process by which specialties are recognized in fields other than those involving physicians.

The study results identified that the number of office locations rather than their structures (i.e., solo versus group practices) or geographical locations (i.e., within or outside the city of Chicago) as strong associations with surgical specialization. One possible interpretation of this outcome is that patient referral exchanges between podiatrists and physicians are significantly more likely if podiatrists' offices were located in hospitals and/or multi-group office complexes where physicians are located. Rather than geographical location and structural nature of podiatric medical practice, it may be that locations allowing reciprocal patient referrals are more likely to enhance the likelihood that podiatrists declare surgical specialization and engage in more surgeries.

The strong and positive relationship between referrals made to endocrinologists and surgical specialization is analogous to the findings and outcomes of patient exchanges between physicians and podiatrists (Chumbler, Grimm 1994, 1995). In a recent study of older diabetic patients in four New York (inner-city) family care clinics, Wylie-Rosett et al (1995) found that 35 percent of all patient charts provided evidence of foot care referrals from primary care physicians, mostly to podiatrists. Thus, what may be involved in the reconfiguration of treatment for older adults with diabetes is dual roles played by podiatrists. With 14 million Americans having diagnosed diabetes, it is imperative for managed care organizations to effectively and efficiently assess each patient with diabetes and acknowledge that podiatrists are one of several practitioners that should treat diabetics. Physicians who practice in medical groups should have surgical podiatrists as colleagues who they can discuss cases (Wirth, Allcorn 1993).

The results showed that full medical-staff privileges in a hospital rather than amount of hours per week working in a hospital was significantly associated with surgical specialization. Even though podiatrists still perform some surgeries in their offices rather than hospitals, our results suggest that it is the membership on hospital medical staffs which allows podiatrists to enhance their surgical prowess. Previous research on health care occupations has suggested that linkages with hospitals permits the professional

environment for role expansion (Abbott 1988; Hafferty, Light 1995). Results from the present investigation corroborate previous research suggesting that podiatrists with full-medical staff privileges in a hospital are likely to be involved in surgical activities and exchange patient referrals with physicians (Chumbler, Grimm 1995; Grimm, Chumbler 1995). Thus, our research showed that work settings are not necessarily the only or even the predominant force behind integrated relationships between physicians and other providers.

Interpretations of our findings are limited because of the data. First, our response rate was decent, but not to optimal. Even with the modest response rate, the sample was representative of the most recent samples of Chicago area and nationwide podiatrists. Another weakness of the study is that we were unable to collect any data on the respondents' perceptions of managed care organizations or their future role in such organizations.

## CONCLUSION

Overall, our exploratory study provided some indications of why podiatry played an increased role in health care as compared to the traditional authority and practice activities of physicians. We found that neither the absence nor full autonomy nor full time surgical specialization prevented podiatrists from sharing more work with physicians. In fact, it is because many podiatrists are both specialists and primary-care providers that they have several viable ways to share work with physicians. Interestingly, we found that both work settings and credentials are a part of the process by which podiatrists' work helps reconfigure the activities of other providers.

Future research could use these findings as an impetus for examining the changing nature of medical work in other health care occupations, for example, clinical nurse specialists, nurse practitioners, and physician assistants. As Hafferty and Light (1995) pointed out, more information needs to be known about the internal activities of these occupational groups, and to be understood about how they are positioning themselves relative to other practitioners in U.S. health care delivery system.

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