Original Research

Practice patterns of family physicians with 2-year residency v. 1-year internship training: Do both roads lead to Rome?

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Are there differences in patterns of practice between actively practising physicians who have been certified after a 2-year family practice residency and matched physicians without certification who have completed the standard 1-year internship? With the use of billing files prepared by the British Columbia Medical Association a group of 65 family practice certificants in active practice in British Columbia was compared with a control group of 130 internship trainees matched by year and school of graduation, category of billing (i.e., solo or group) and region. A wide range of practice features was assessed for the fiscal years 1984–85, 1985–86 and 1986–87. No differences were detected between the groups in 1986–87 for the following practice variables: number of patients (1888 and 1842 respectively), number of personal services billed for (7265 and 7173), number of personal services per patient (3.9), amount of funding for personal services ($140 192 and $140 100) and amount per patient for personal services ($77 and $79). Age-adjusted costs for male and female patients were similar in the two groups. Of six services thought to be influenced by type of training, only maternity care generated a significantly higher number of billings in the study group (341 v. 249). These results suggest that there is no demonstrable effect of training on patterns of practice. However, the question of the effect of training on quality of care and whether the 2-year residency may have a longer effect on practice patterns should be the focus of future research.

Nous avons cherché à savoir s'il existe des différences de style d'exercice entre un groupe de 65 praticiens détenteurs d'un certificat à la suite de la résidence de 2 ans en médecine familiale et un groupe de 130 confrères qui n'ont fait que l'internat obligatoire de 1 an, appariés quant à l'année du doctorat, à la faculté, au mode de facturation (individuelle ou en groupe) et à la région d'exercice. À cette fin nous examinons les dossiers de facturation de la British Columbia Medical Association à l'égard d'un grand nombre de paramètres pour les années fiscales 1984–85, 1985–86 et 1986–87. Ces groupes ne diffèrent nullement en 1986–87 sous les rapports suivants: nombre de clients (1888 et 1842 respectivement), nombre de services facturés (7265 et 7173), nombre de services par client (3,9), total des sommes pour ces services (140 192 $ et 140 100 $), somme par client (77 $ et 79 $). Compte tenu de l'âge des clients, les coûts des services rendus aux femmes et aux hommes sont comparables dans les deux groupes. Si le genre de formation post-doctorale a paru affecter la prestation de six genres de services, ce n'est que dans le cas de l'un d'entre ceux-ci, soit les soins de maternité, que les détenteurs du certificat présentent significativement plus de factures que les témoins, soit 341 contre 249. Le tout laisse croire que le genre de formation n'exerce aucune influence sur le style d'exercice. Cependant, il reste à savoir s'il a une incidence sur la qualité des soins et quel sera à longue échéance l'effet de la résidence de 2 ans sur l'exercice de la médecine.

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In Canada the traditional postgraduate training route for general practitioners has been the hospital-based junior rotating internship. However, in 1966, family practice residency training programs were established and accredited by the College of Family Physicians of Canada (CFPC). One of the major goals of these 2-year programs was to upgrade the quality of medical care in general practice. At present all 16 Canadian medical schools offer family practice residency training.

Because of controversy about the merits of these two types of training programs the CMA in 1981 created the Task Force on Education for the Provision of Primary Care Services (the Wilson Task Force). In 1984 this group[1] recommended a 2-year prelicensure training requirement under the auspices of the CFPC. In 1986 an invitational committee of the CMA (the Cox Committee)[2] supported this recommendation and stated that "integrated two-year family medicine training programs should continue to be the preferred route to general or family practice". Finally, in 1987 the Federation of Provincial Medical Licensing Authorities of Canada (FPMLAC)[3] recommended a 2-year requirement. As of July 1988 Quebec became the first province to require university-based 2-year family practice residency training before licensure. Other provinces are expected to follow suit.

These developments have indicated an ongoing need to evaluate the programs from several perspectives. Trainees are concerned about undue lengthening of their professional education, practitioners about competence and quality of care, patients about satisfaction, and governments about cost and manpower. In the face of competing points of view we felt that to evaluate this issue we must first determine whether patterns of practice are influenced by type of training. Indeed, as Corley[4] noted, "the validation of an education program lies in the professional practices of its graduates".

Although several articles have explored this issue,[5-12] it is surprising that we could locate only three Canadian studies that objectively compared the effects on patterns of practice of the two types of training.[13-15] Unfortunately, these studies had several technical problems, such as failure to match physicians on important confounding variables,[13,15] small sample[14] and lack of formal statistical analysis.[15] We therefore undertook a study to answer the question Are there differences in patterns of practice between actively practising physicians who have been certified after a 2-year family practice residency and matched physicians without certification who have completed the standard 1-year internship?

Methods

Data sources

All data were obtained from billing files of the British Columbia Medical Association (BCMA) prepared by the Medical Services Plan of British Columbia. The initial file used to select the physicians contained only data pertaining to physician characteristics (year of birth, medical school and year of graduation, type of training, category of billing, region and billing status). Type of training was defined as 2-year training with CFPC certification, 1-year training (internship) with CFPC certification or 1-year training without CFPC certification. Category of billing was defined as solo practice, group practice with individual billing numbers or group practice with a common billing number. Region referred to 1 of 12 BCMA geographic areas; for the purposes of this study the regions were defined as lower mainland (including greater Vancouver), Vancouver Island and other. The BCMA defines billing status as "active" if the physician is billing at least 0.75 of a full-time equivalent (FTE). The FTE for a physician was determined by the mean billings (in dollars) of all comparable physicians in the same region. FTEs did not include sessional payments.

Inclusion criteria

Physicians were eligible for inclusion if they were (a) in general practice in British Columbia in 1986–87 and participating in the Medical Services Plan, (b) had either obtained certification from the CFPC after a 2-year family practice residency or completed a 1-year internship without certification, (c) had graduated from a Canadian medical school between 1975 and 1983, and (d) had maintained active status billing from 1984 through 1987. The requirement for active status was meant to ensure that the physicians were well established in their practices and that they spent most of their professional time in primary care activities. It also restricted the study to physicians whose primary source of income was fee-for-service billings to the provincial medical plan. We specifically excluded physicians who had completed a 1-year internship but subsequently were allowed to sit the CFPC examination.

Selection of study and control groups

The study group consisted of all eligible physicians who had been certified by the CFPC after a 2-year family practice residency. To form the control group two physicians were matched to each physician in the study group according to the following variables: category of billing, region, year of graduation (1975–77, 1978–80 or 1981–83) and medical school. When more than two physicians could be matched to a study group physician the selection was made at random. Sex was not used as a matching variable because we felt that the main difference between male and female physicians (i.e., amount of time worked) would be adequately controlled by the requirement for active status.

We used only the initial data file for the group selections — that is, without knowledge of the physicians' practice patterns. After the groups were chosen the physicians' identification numbers were sent to the BCMA, where each physician's practice variables were extracted from the billing file.

Study period and practice variables

The two groups of physicians were compared according to each of the fiscal years 1984–85, 1985–86 and 1986–87. Most information in the billing files is categorized as "personal" or "referred out"; the former refers to a service performed by the study or control group physician, whereas the latter refers to any service performed by the first level of consultant as a consequence of a direct referral by the study or control group physician. Thus, services (and costs) generated as a result of subsequent referrals were not included in referred-out calculations.

For each physician we also computed sex-specific age-adjusted costs per patient by applying the physician's sex- and age-specific costs to the age distribution of the pooled patients of all the physicians. In addition, we compared six specific practice services that were thought *a priori* to be influenced by the family practice residency program: counselling, home visits, institutional visits, maternity care, and minor and nonminor surgical procedures. For each of these services we hypothesized that the number of patients and visits would be higher in the study group. The comparison of practice services was done only for 1986–87 because changes in coding made comparisons unreliable for the previous 2 years.

Analysis

Statistical analysis was done with the Student's *t*-test and chi-squared test. Given the large number of variables, we adopted *a priori* the convention that p values less than 0.001 were significant, that those greater than 0.05 were not significant, and that intermediate values were suggestive and worthy of further study.

Results

According to the BCMA files 133 family practice certificants had graduated from medical school after 1975, had completed a 2-year family practice residency and had participated in the medical services plan in 1986–87. Of these, 68 (51%) had maintained active status throughout 1984–87. There were 771 family practitioners who had graduated from medical school after 1975, had completed a 1-year internship without CFPC certification and had participated in the Medical Services Plan in 1986–87. Of these, 348 (45%) had maintained active status throughout 1984–87 and were thus eligible as controls. The proportion of physicians who met the requirement for active status in 1984–87 was similar in the two groups (51% v. 45%).

Of the 68 family practice certificants 3 were graduates of foreign medical schools and were eliminated. Thus, the study group comprised 65 physicians. According to the matching, 130 physicians were chosen from all eligible controls for the control group. The proportions of men in the study and control groups were 75% and 84% respectively. The median year of graduation for both groups was 1978, and the median age as of 1987 was 35 years (extremes 30 and 46 for the study group and 28 and 49 for the control group). Of all the physicians 50% were from the lower mainland (including greater Vancouver), 13% from Vancouver Island and 37% from the remainder of British Columbia. A total of 42% were in solo practice, 17% in group practice with individual billing numbers and 41% in group practice with a common billing number.

Although we examined information for three fiscal years, for the sake of brevity we present only that for 1986–87. We found no significant differences between the study and control groups in the practice variables studied (Table I). Striking similarities also existed with regard to services referred out, particularly in the proportions of each practice referred out during the year (51% and 56% respectively).

Other similarities between the study and control groups were noted in the number of laboratory services per patient (2.4 and 2.7 respectively), the mean cost of laboratory services per patient ($22.32 and $25.66), the number of radiology services per patient (0.25 and 0.26) and the mean cost of radiology services per patient ($7.96 and $8.27).

The results of an analysis of practice variables according to the sex of the patients are shown in Table II. The number of male and female patients, the number of services provided, the earnings derived from treating those patients and the age-adjusted cost per male and female patient were virtually identical for the study and control groups.

Sex- and age-specific costs per patient for the study and control groups are shown in Fig. 1. No significant differences were found between the groups, except for women aged 75 years or older, for whom a difference of intermediate significance was found ($p = 0.022$).

Table III shows the results for six specific services. Although no differences were noted for counselling, home visits, institutional visits, and minor or nonminor surgical procedures, we did detect a nonsignificant difference ($p = 0.05$) in the mean number of women receiving maternity care (62 v. 50) and a marginally significant difference ($p = 0.001$) in the number of maternity services billed (341 v. 249).

Similar studies for the fiscal years 1984–85 and 1985–86 also showed no differences between the groups.

Discussion

Supporters of 2-year residency training have cited the findings of Brennan and Stewart,[13] who compared family practice graduates with controls at the University of Western Ontario; they found that family practice graduates were more satisfied with practice, placed greater importance on emotional aspects of illness, conducted more psychotherapy, spent more time with patients and provided more noninstitutional care. Unfortunately, because these groups were not matched on several important potentially confounding variables, interpretation of the data is difficult.

Supporters of the 1-year internship have cited the findings of Curry,[14] who conducted a similar study of trainees from Dalhousie University, Halifax, and found no differences in the number of medical services billed for in each of 15 service classes. Although in this study the groups were matched for practice location, age and sex the samples were very small; acceptance of the negative results is therefore tenuous.

An ideal comparison of educational interventions should be done with a randomized controlled study of medical graduates assigned to either a 2-year family practice residency or a 1-year internship. Thus, confounding variables arising from self-selection of physicians into one type of program or another would be avoided. Because such a trial is not feasible we conducted an observational study that compared graduates of the two programs. To make the comparisons as valid as possible we matched the physicians on what we considered were critical, potentially confounding variables, including year and school of graduation, category of billing and region.

Given the various perspectives from which the two types of training could be compared, we believed that an assessment of patterns of practice would be the most reasonable starting point. First, the data with which to make the comparisons were readily available. Although practice patterns were assessed indirectly through medical plan billings, we felt that this type of measurement accurately reflected the services provided. Second, it seems plausible that any measurable changes in care produced by the 2-year program would be reflected to some extent in differences in practice patterns. We were therefore surprised at the striking similarity between two groups with apparently divergent training experiences. We detected no differences over a wide range of practice variables; indeed, only one measurement, services for mater-

Table I — Comparison of selected practice variables between family physicians in the study and control groups for the fiscal year 1986–87

Practice variable	Mean (and standard deviation [SD])		p value
	Study group	Control group	
No. of patients treated	1 888 (606)	1 842 (616)	0.62
No. of services billed for*	11 938 (3 324)	11 878 (3 398)	0.91
Personal	7 265 (2 253)	7 173 (2 265)	0.79
Referred out	4 832 (1 735)	4 938 (1 822)	0.69
No. of services per patient*	6.6 (1.7)	7.0 (2.8)	0.23
Personal	3.9 (0.9)	3.9 (1.1)	0.88
Referred out	2.7 (1.0)	3.1 (2.5)	0.14
Amount ($) paid*	236 371 (66 134)	237 839 (66 347)	0.88
For personal services	140 192 (41 878)	140 100 (41 337)	0.98
For referred-out services	96 118 (32 247)	98 370 (34 603)	0.66
Amount ($) per patient*	131 (33)	137 (41)	0.21
For personal services	77 (18)	79 (22)	0.44
For referred-out services	103 (18)	109 (28)	0.08

*Includes services performed by physician (personal) and by first-level consultants to whom patients were referred (referred-out).

Table II — Comparison of personal-service practice variables for male and female patients between the study and control groups for the fiscal year 1986–87

Practice variable	Mean (and SD)		p value
	Study group	Control group	
Male patients			
No. treated	795 (333)	786 (332)	0.85
No. of services billed for	2 514 (1 174)	2 567 (1 085)	0.76
Physician earnings ($)	50 137 (22 769)	52 255 (21 265)	0.52
Age-adjusted cost ($) per patient	63.32 (14.60)	67.61 (19.10)	0.09
Female patients			
No. treated	1 028 (301)	986 (315)	0.37
No. of services billed for	4 325 (1 241)	4 099 (1 328)	0.25
Physician earnings ($)	85 019 (23 256)	82 038 (24 957)	0.42
Age-adjusted cost ($) per patient	84.20 (19.22)	85.27 (20.87)	0.73

nity care, produced a statistically significant difference. Although this result could have been caused by chance, given the number of comparisons we made, it could also represent a true effect of the 2-year program.

Our study had several advantages over previous Canadian studies, such as a provincial focus rather than a program focus and sampling of graduates of both types of programs from all across the country rather than from a single institution. We also made our comparisons with physicians who were established in full-time practice, so that the results are more likely to reflect long-term practice patterns.

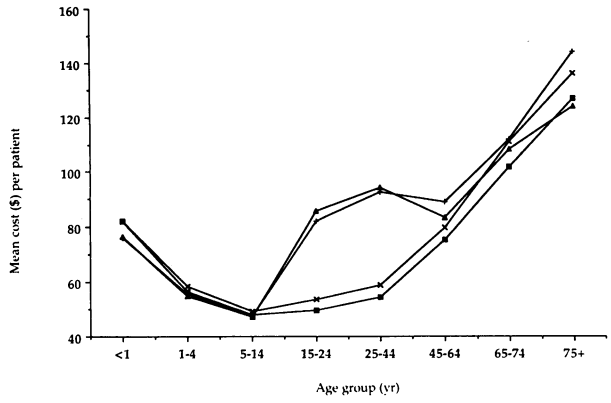

Fig. 1 — Mean cost per patient across eight age groups stratified by patient's sex and physician group (study [■ = male, Δ = female patients] v. control [× = male, + = female patients]).

Table III — Comparison of personal services between the study and control groups for the fiscal year 1986–87

Service	Mean (and SD) Study group	Control group	p value
Counselling			
No. of patients	125 (103)	129 (94)	0.79
No. of services billed for	164 (156)	172 (142)	0.74
Home visits			
No. of patients	14 (16)	18 (22)	0.17
No. of services billed for	31 (47)	40 (67)	0.33
Institutional visits			
No. of patients	120 (48)	114 (55)	0.44
No. of services billed for	542 (294)	629 (421)	0.10
Maternity care			
No. of patients	62 (32)	50 (47)	0.05
No. of services billed for	341 (186)	249 (164)	0.001
Visits for minor surgical procedures			
No. of patients	48 (29)	55 (36)	0.20
No. of services billed for	68 (43)	76 (55)	0.31
Visits for nonminor surgical procedures			
No. of patients	92 (56)	92 (82)	0.97
No. of services billed for	133 (95)	134 (117)	0.98

There are several alternative explanations for our findings. In any "negative study" there is always the possibility of a type II error; that is, a true difference could be missed because of a sampling error. However, the size of our sample made this unlikely, giving the study, for example, 80% power to detect a $10 (or 15%) reduction in the mean age-adjusted cost per male patient, even with a stringent confidence level of 0.001. Moreover, to explain our results one would have to postulate the simultaneous occurrence of several type II errors, which is extremely unlikely.

It may also have been that by restricting our study to physicians with "active" status in 1984–87 or by matching according to type and location of practice we artifactually created similar groups with respect to practice patterns — that is, we overmatched. For example, we may have overrepresented the graduates of 2-year residency training programs with the greatest number of patient visits and services and thus created a biased comparison. However, the proportion of physicians with active status was similar in the two groups, thus militating against the possibility of such a selection bias.

In considering the role of type and location of practice it is important to separate the effects of training on two types of decisions. The first type consists of the choice of practice type (solo v. group) and location (urban v. rural). The second type encompasses clinical decision-making about patient care, such as whether a physician chooses to make a particular referral or order a specific laboratory test. Because both type and location of practice may influence the available options for clinical decision-making and thus indirectly affect patterns of care any analysis must consider these variables; we chose to do so by matching our groups. It is possible, however, that the effects of the 2-year residency are mediated solely through the first set of decisions — about practice type and location. Indeed, when comparisons were made between all 2-year residency graduates and all 1-year trainees, rather than between just the matched groups, several trends were apparent. First, the residency graduates were predictably younger, because the family practice residency is a recent phenomenon. They were also somewhat more likely to be in a group practice and to practise in a rural area; however, these effects were inconsistent across age groups, which suggests that temporal factors such as recent practice saturation of urban areas and the recent trend toward group practice were just as influential as any intrinsic preference of the physicians, if not more so.

Proponents of the 2-year residency program have generally argued that its main beneficial effects are not on extrinsic decisions about practice type and location but, rather, on clinical decision-making and, hence, practice patterns.[9] Our observations suggest that, all other things being equal in

terms of age and practice type and location, this argument does not appear to be substantiated. We did not sample the relatively small number of physicians who choose to practise entirely outside the fee-for-service system, so our results can be applied only to physicians practising to any degree within the system. However, this is reasonable, because it was our intent to study the effects of training on patterns of practice within the commonest form of primary care.

How can the striking similarities between our groups be explained in the face of the apparent differences in their training? It may be that the training, at least with regard to duration, is not as different as it first appears. Many physicians, after completion of a 1-year internship, may choose to take further elective rotations (e.g., in anesthesia or obstetrics) before entering full-time practice. As well, some physicians may have partially completed a specialty residency program before entering general practice. Both factors may explain Rourke's finding that among rural general practitioners, only one-third of whom were family practice residency graduates, the average duration of postgraduate training was 2.5 years.[16] Although Rourke's study was limited to rural physicians in one county and did not describe in detail the types of additional training received, particularly by physicians who had undergone a 1-year internship, the results suggest that our groups may not have differed significantly with regard to duration of training. To accept this observation as an explanation for our results, however, one would have to postulate, first, that most 1-year graduates receive additional training, so that the junior internship has become a 1-year program in name only, and, second, that duration of training is a critical determinant of practice patterns.

A more plausible explanation is that regardless of whether the duration or content of training has any immediate effects the ultimate determinant of the practice pattern adopted by a physician is the practice pattern of his or her peers in the same community. The peers, in turn, are influenced by various environmental factors, such as patient expectations and demands, epidemiologic factors, institutional requirements, economic factors and medicolegal issues. If there are different effects arising from different training routes they are likely to be transient; any differences are apt to be rapidly overwhelmed by environmental factors as physicians are assimilated into the local practice community. We must therefore caution that our study was carried out when relatively small numbers of 2-year residency certificants entered into communities with larger numbers of internship trainees. Our results may therefore represent only a short-term phenomenon. Indeed, we might hypothesize that as family practice residency graduates constitute an increasing proportion of all general practitioners any effects of the residency training on patterns of practice will be increasingly likely to be maintained.

A critical caveat in interpreting our results is that quality of care could not be addressed. There may have been significant differences in quality of care between the groups in terms of appropriateness and patient and physician satisfaction that we were unable to measure within the context of our study and that should be the focus of further investigation. However, even if there were differences it is unlikely on the basis of present data that they would be reflected in short-term cost savings or decreased use of health care resources.

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References

1. *Family Practice Training: an Evolutionary Plan. Report of the Canadian Medical Association Task Force on Education for the Provision of Primary Care Services to CMA General Council, 1984*, Can Med Assoc, Ottawa, 1984
2. Family practice training: continuing the evolution. In *Proceedings of the 119th Annual Meeting Including the Transactions of the General Council, Winnipeg, Manitoba, August 11-12, 1986*, Can Med Assoc, Ottawa, 1986: 70-119
3. *Report to the Council of the Federation of Provincial Medical Licensing Authorities of Canada from the Task Force on Medical Licensure*, Federation of Provincial Medical Licensing Authorities of Canada, Ottawa, 1987
4. Corley JB: In-training residency evaluation. *J Fam Pract* 1976; 3: 499-504
5. Hines RM, Curry DJ: The consultation process and physician satisfaction: review of referral patterns in three urban family practice units. *Can Med Assoc J* 1978; 118: 1065-1066, 1071-1073
6. Brock C: Consultation and referral patterns of family physicians. *J Fam Pract* 1977; 4: 1129-1134
7. Biehn J: Family medicine residency: Does it make a difference? *Can Fam Physician* 1983; 29: 1031-1034
8. Cherkin OC, Rosenblatt RA, Hart LG et al: A comparison of the patients and practices of recent graduates of family practice and general internal medicine residency programs. *Med Care* 1986; 24: 1136-1150
9. McCrainie EW, Hornsby JL, Calvert JC: Practice and career satisfaction among residency trained family physicians: a national survey. *J Fam Pract* 1982; 14: 1107-1114
10. Kane RL, Gardner J, Wright DD et al: Differences in the outcomes of acute episodes of care provided by various types of family practitioners. *J Fam Pract* 1978; 6: 133-138
11. Hueston WJ: The influence of a family practice residency on the costs of in-patient diagnostic testing. *J Fam Pract* 1986; 23: 559-563
12. Allingham JD, Heaton CJ, Wakefield J et al: A decline in generalism for family medicine? First-practice profile ideals and realities. *Can Fam Physician* 1988; 34: 289-293
13. Brennan M, Stewart M: Attitudes and patterns of practice: a comparison of graduates of a residency program in family medicine and controls. *J Fam Pract* 1978; 7: 741-748
14. Curry L: Post-graduate training route and content of subsequent practice. *Can Fam Physician* 1985; 31: 1417-1420
15. Frenette J: What do family practice graduates do? A comparative study. *Can Fam Physician* 1984; 30: 2281-2288
16. Rourke J: Rural family practice. Part I: A county profile. *Can Fam Physician* 1988; 34: 1029-1032

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