

A comparison of the practice activities of trainees and principals

D.M. FLEMING, FRCGP

Research Fellow, Birmingham Research Unit of the Royal College of General Practitioners

SUMMARY. *The practice activities of trainees are compared with those of principals using a large data base to provide a factual basis for the discussion of the workload and activities of trainees.*

Trainees undertook an average of 187 consultations including 32 home visits over two weeks compared with 301 consultations and 50 home visits for principals. These values show that trainees are seeing sufficient patients for adequate learning and are not being exploited. There were relatively more children and more patients with acute respiratory disorders among the patients consulting trainees compared with those consulting principals. However, trainees saw fewer elderly patients, fewer patients presenting for preventive care and fewer patients with cardiovascular disorders than principals. These deficiencies in the range of patients that trainees are seeing are undesirable. Antibiotics were prescribed more frequently by trainees than by principals but trainees prescribed fewer psychotropic drugs especially as repeat prescriptions and their referral rates and investigation rates were both lower. This probably reflects a consulting profile in which there are more young patients with acute than chronic problems.

Introduction

THE workload of trainee general practitioners must be determined carefully. Exploitation or boredom are not conducive to learning.¹ Even within an agreed teaching programme there is a fine balance between clinical experience and supplementary learning activities.² Richardson and colleagues studied 17 trainees over four weeks and reported that trainees saw an average of 93 patients per week — half the number seen by principals.¹ Irvine and colleagues studied 23 trainees over one week and reported that they saw an average of 118 patients.² Wide variations were noted in both studies.

As a trainee O'Flanagan questioned whether he was seeing an appropriate proportion of patients with chronic illnesses and suggested that consultation patterns of trainees should be monitored.³ Carney, on comparing his own experience with that of the partners in his training practice, saw more patients presenting with upper respiratory illnesses and fewer patients with major illnesses and obstetric and gynaecological problems.⁴ Stubbings and Gowers noted that younger patients were seeing the trainee.⁵ This was also noticed by Fairley, who observed that patients consulting the trainee were less likely to have long-term health problems.⁶ Hasler studied the experience of 59 trainees in the Oxford region and considered that the follow-up arrangements for patients with chronic illness to see trainees were inadequate.⁷ Fouracre and Savory have suggested how patients might be steered towards the trainee so that proper and continuing management schedules can be organized satisfactorily and the problems surrounding chronic illness can be avoided.⁸

The aims of this study were to examine whether these reported observations have general application and to look for differences between principals and trainees.

Method

The data base used was the consolidated file from practice activity analyses undertaken over the last four years.⁹ These data are derived from the returns of several hundred principals and trainees who have analysed one aspect of their activity over a two- or four-week period. Each analysis is specific to one area of activity but each provides information about consultation patterns in varying detail.

Data sheets of satisfactory recording quality were summarized as a computer file and analysed using the 'Minitab' statistical package.¹⁰ Data from principals and trainees were analysed separately and are compared in this study. The data base for individual practice activities generally includes a minimum of 100 principals and 50 trainees. Some doctors provided data in more than one of the activity analyses, though these were undertaken at different times and the numbers concerned are relatively small in the context of the total data file.

The numbers of consultations and visits undertaken by principals and by trainees were normally distributed and were examined using a t-test. Some of the activity rates showed a skewed distribution and these were examined using a chi-square test. To permit comparison with other studies, consultation statistics for principals were also presented using the estimated practice list size as a denominator. The estimate was obtained by asking the principals to specify the total practice list size and their proportional contribution to the practice during the study period, thus allowing for any absences. Differences between principals and trainees found in activity rates were investigated further using group consolidated results. Because of the large size of the samples involved, the significance of the differences between the two groups is often extremely high ($P < 0.001$) and test results are therefore not reported.

Results

Consultations and visits

Several of the practice activity analysis results provided data on consultations and these are summarized according to the duration of recording (Table 1). In studies lasting two weeks, the mean number of consultations undertaken by principals was 301 compared with 187 for trainees and the mean number of home visits made by principals was 50 compared with 32 for trainees. The mean number of consultations per 1000 patients was 130 for principals — equivalent to 3.25 consultations per patient per annum (assuming 50 working weeks in a year). The mean number of consultations undertaken by principals ($n=200$) in the four-week study was 573 compared with 384 by trainees ($n=47$). Principals made an average of 87 home visits compared with 51 by trainees.

The mean visiting rate for principals ($n=1508$) was 155 visits per 1000 consultations compared with a rate of 166 for trainees ($n=289$). The distribution of visiting rates among trainees differed from that of principals (Table 2). The difference was related to the small excess of high rates among trainees — 58 returns showed a visiting rate equal to or in excess of 225 per 1000 consultations compared with 41 expected in a chi-square calculation.

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Table 1. Number of consultations and home visits made by principals and trainees.

	Principals		Trainees	
	Number of principals	Mean (\pm SD) number per principal	Number of trainees	Mean (\pm SD) number per trainee
<i>Studies lasting two weeks</i>				
Consultations	1605	301.4 (\pm 89.5)	329	186.8 (\pm 67.4)***
Home visits	1308	50.3 (\pm 23.0)	242	32.4 (\pm 16.2)***
Consultations per 1000 patients	1605	129.9 (\pm 37.0)	NA	
<i>Studies lasting four weeks</i>				
Consultations	200	573.4 (\pm 178.3)	47	384.2 (\pm 112.6)***
Home visits	200	87.3 (\pm 44.0)	47	51.0 (\pm 23.8)***
Consultations per 1000 patients	200	259.6 (\pm 61.6)	NA	

SD = standard deviation. NA = not applicable. *** $P < 0.001$, trainees vs principals (t-test).

Table 2. Distribution of visiting rates per 1000 consultations for principals ($n = 1508$) and trainees ($n = 289$).

Visiting rate per 1000 consultations	Number (%) of principals	Number (%) of trainees
<75	134 (8.9)	23 (8.0)
75–124	361 (23.9)	63 (21.8)
125–174	485 (32.2)	88 (30.4)
175–224	332 (22.0)	57 (19.7)
225–274	139 (9.2)	37 (12.8)
≥ 275	57 (3.8)	21 (7.3)

$\chi^2 = 115$, 5 degrees of freedom, $P < 0.05$.

Table 3. The age–sex distribution of all patients consulting.

Age of patients (years)	Percentage distribution of consultations			
	Principals		Trainees	
	Male patients ($n = 63\ 418$)	Female patients ($n = 100\ 951$)	Male patients ($n = 8166$)	Female patients ($n = 11\ 981$)
0–4	4.6	4.1	6.3	5.8
5–14	5.1	5.1	7.0	7.3
15–44	12.6	27.9	14.3	27.7
45–64	8.7	11.6	7.1	9.6
≥ 65	7.6	12.7	5.8	9.1
Total	38.6	61.4	40.5	59.5

n = total number of consultations.

The age–sex distribution of the patients consulting principals and trainees is shown in Table 3. The results show a male:female ratio of approximately 40:60 for both data sets. There were highly significant differences between the distributions of patients consulting principals and those consulting trainees, especially for young and old patients — trainees were consulted by more children and fewer elderly patients than principals.

The data provided a distribution of consultations by time of day and location (Table 4). Approximately 400 000 consultations by principals and 54 000 by trainees were analysed. The proportion of patients consulting trainees in special clinics was less than half of the proportion consulting principals. Additional information was obtained on approximately 15 000 home visits made by principals and on 1000 made by trainees. The propor-

tion of these home visits made as doctor-initiated follow-up visits was 41.2% for principals and 40.2% for trainees. The proportions of follow-up home visits in each patient age group were similar for principals and trainees — patients aged 0–14 years 15%, aged 15–64 years 35%, aged 65 years or more 50%.

The distribution of morbidity encountered by 69 principals and 67 trainees over two weeks is shown in Table 5. The distributions for principals and trainees differed to a highly significant extent; fewer encounters concerned with preventive care or cardiovascular disorders and more encounters involving respiratory disease were presented to trainees.

Table 4. The distribution of consultations by time of day and type of session.

	Percentage distribution of consultations	
	Principals ($n = 384\ 950$)	Trainees ($n = 53\ 823$)
Morning surgery	46.8	48.0
Afternoon/evening surgery	31.9	33.8
Home visits	15.7	15.6
Clinics	5.7	2.6

n = total number of consultations.

Prescribing

The mean number of antibiotics prescribed per 1000 consultations was 123 for principals ($n = 261$) compared with 186 for trainees ($n = 87$) (Table 6). Significantly higher prescribing rates were found for trainees — the maximum difference was for patients in the age group 15–64 years but the difference was observed for all patient age groups and most drug categories.

The mean number of patients receiving psychotropic drugs per 1000 consultations was 135 for principals which considerably exceeded the rate of 88 found for trainees (Table 7). The mean rates for the issue of psychotropic drug prescriptions were found to be a little higher. Analysis by mode of prescribing showed that the rates for new prescriptions (prescriptions issued for the first time in an episode of illness) were similar for principals and trainees but lower rates were found for trainees in both continuing prescriptions (prescriptions issued at a consultation in which a course of therapy is continued) and in repeat prescriptions (prescriptions issued without any direct contact with the patient at the time of issue) (Table 7). Analysis by the type of drug showed that the difference between principals and trainees

Table 5. The distribution of problems encountered at consultation by diagnostic category.

Diagnostic category	Percentage distribution of problems encountered			
	Principals		Trainees	
	Male patients (n = 7053)	Female patients (n = 10 762)	Male patients (n = 4226)	Female patients (n = 6383)
Intestinal and other infectious diseases	6.8	4.4	8.2	6.1
Neoplastic disease	1.6	1.3	1.1	1.2
Endocrine and metabolic disease	4.1	3.8	3.5	3.3
Diseases of the blood and blood forming organs	0.9	1.3	0.8	1.0
Mental disorders	4.7	6.9	3.6	6.5
Diseases of the nervous system and sense organs	6.1	5.6	6.9	6.9
Cardiovascular diseases	10.4	8.3	7.1	5.5
Diseases of the respiratory system	17.7	11.8	21.8	15.8
Disorders of the digestive system	6.9	5.6	8.7	6.7
Genitourinary disorders	3.6	9.2	3.0	10.5
Diseases and complications of pregnancy	—	4.4	—	3.8
Diseases of the skin and subcutaneous tissue	8.9	6.5	8.7	7.2
Arthritic and musculoskeletal disorders	12.2	9.7	12.0	8.5
Congenital anomalies and perinatal diseases	0.5	0.4	0.3	0.5
Symptoms and ill-defined conditions	5.1	5.2	5.3	5.6
Fractures, trauma, poisoning etc.	3.9	2.2	4.3	2.0
Preventive care	5.4	11.5	3.1	7.1
Social problems	1.3	1.9	1.6	1.9

n = total number of problems encountered

Table 6. Rates of antibiotic prescribing for principals (n = 261) and trainees (n = 87).

	Rates of antibiotic prescribing (per 1000 consultations)	
	Principals	Trainees
Mean rate (\pm SD)	123 (\pm 52)	186 (\pm 102)
<i>Age of patients (years)</i>		
0-4	266	310
5-14	235	273
15-64	95	152
\geq 65	122	133
<i>Drug group</i>		
Natural penicillins	23	39
Other penicillins	47	74
Erythromycin	13	21
Tetracycline	18	14
Sulphonamides	1	1
Co-trimoxazole etc.	14	28
Others	6	9
Total	122	186

SD = standard deviation.

was broadly spread. Principals issued 1.18 prescriptions per patient receiving any psychotropic drug and trainees 1.09.

Referrals and investigations

The mean number of referrals was 45 per 1000 consultations for principals (n = 200) and 35 for trainees (n = 47) (Table 8). The distribution of results in the two groups differed significantly especially for outpatient referrals. Among the larger differences obtained from analysis of the results by specialty were those for gynaecology, obstetrics, orthopaedics and psychiatry but in all cases rates were lower for trainees than for principals.

The pattern of investigations (Table 9) was broadly similar in both groups though principals investigated patients a little more frequently than trainees. This difference was significant.

Discussion

This comparison between principals and trainees did not use a random sample of either, nor was it a comparison between trainers and trainees. The appeal of practice activity analyses, however, has been strongest in the practices involved in training and if any bias exists in the data concerning principals it

Table 7. Rates of psychotropic drug prescribing for principals (n = 416) and trainees (n = 81).

	Rates of psychotropic drug prescribing (per 1000 consultations)	
	Principals	Trainees
Mean rate (\pm SD) for patients receiving psychotropic drugs	135 (\pm 71)	88 (\pm 72)
Mean rate (\pm SD) of issue	159 (\pm 86)	97 (\pm 78)
<i>Mode of prescribing</i>		
New prescriptions	22	19
Continuing prescriptions	52	29
Repeat prescriptions	82	43
<i>Drug group</i>		
Major tranquillizers	8	4
Minor tranquillizers	58	41
Antidepressants	36	18
Hypnotics	53	27
Others	1	1
Total	156	91

SD = standard deviation.

Table 8. Rates of referrals to specialists for principals ($n = 200$) and trainees ($n = 47$).

	Rates of referrals (per 1000 consultations)	
	Principals	Trainees
Mean (\pm SD)	45.0 (\pm 18.9)	34.8 (\pm 22.4)
<i>Mode of referral</i>		
Outpatient	35.7	24.8
Domiciliary consultation	2.4	1.8
Hospital admission	6.1	6.1
<i>Specialty</i>		
Dermatology	2.7	2.5
Ear, nose and throat	3.8	3.6
Geriatrics	1.4	1.0
Gynaecology	4.1	2.2
Medicine	5.6	5.0
Obstetrics	3.8	2.2
Ophthalmology	2.6	2.3
Orthopaedics	4.9	3.0
Paediatrics	1.5	1.9
Psychiatry	2.4	1.0
Surgery	8.0	6.4
Other	3.5	1.6
Total	44.2	32.7

SD = standard deviation.

Table 9. Rates of investigations for principals ($n = 339$) and trainees ($n = 99$).

	Rate of investigations (per 1000 consultations)	
	Principals	Trainees
Mean rate (\pm SD) for patients investigated	106 (\pm 51)	98 (\pm 46)
Mean rate (\pm SD) for specimens examined	123 (\pm 65)	115 (\pm 59)
<i>Mode of collection of specimens</i>		
Collected and analysed in practice	31	28
Collected in practice, analysed elsewhere	59	47
Collected and analysed elsewhere	30	31
<i>Specimen</i>		
Blood	35	31
Urine, pregnancy test	5	5
Urine, other test	40	33
Faeces/swab	8	10
Cytology	10	9
Chest X-ray	7	8
Other X-ray	11	9
ECG	3	2
Total	119	107

SD = standard deviation.

is towards an excess of trainers. The data from trainees was drawn from a wide cross section and much has been submitted as part of trainee workshop surveys. Though not a random sample it is likely to be representative.

The published estimates of annual consultation rates are obtained by differing methods and vary from 3.0 to 4.3 per patient.¹¹⁻¹⁵ While the representativeness of the principals providing data in this survey cannot be verified, the overall consulting rates seen here are similar to those obtained in most large studies.

The trainee's workload of 187 consultations in two weeks was approximately 62% of that of principals. Richardson reported a similar workload (93 consultations per week) which he estimated was half that of principals.¹ Irvine estimated rather more — 118 consultations per week. Trainees must see patients in order to obtain experience. At the end of the training year they must be capable of coping with a normal practice workload but at the start of the year a more limited workload is appropriate. The data presented here suggest a satisfactory situation in which the trainees are not exploited but obtain adequate clinical experience.

Trainees were consulted by more children and fewer elderly people than the principals. Related to this, trainees saw more respiratory disorders and fewer cardiovascular disorders. These observations from a large data base confirm the findings from other studies.^{1,3-7} More serious, however, was the lower number of consultations involving preventive care. Many of the results reported here point to this conclusion: first, a smaller proportion of patients consulted trainees in special clinics (antenatal, immunization, family planning, screening clinics and so on); secondly, the proportion of problems encountered among both male and female patients showing the maximum differences were encounters involving preventive care; and thirdly, the differing referral rates for obstetrics imply a lower contact with such cases. Twelve years ago, Irvine and colleagues reported that fewer trainees than principals attended all types of practice clinic.² The situation would appear to be no different now and cannot be regarded as satisfactory, especially as increasing emphasis is placed on preventive care. It is gratifying to note the improved performance by training practices in the field of preventive care¹⁶ but trainee involvement in preventive care is essential if good preventive habits are to be disseminated when these doctors are established as principals.

Trainees prescribed antibiotics more frequently than principals and this is partly explained by the larger proportion of acute respiratory illness seen by trainees which was found here and elsewhere.¹ The difference in prescribing between trainees and principals was greatest for patients aged 15-64 years. Relatively more patients with acute respiratory disorders consulted trainees than principals and though this must influence antibiotic prescribing, it is surprising that the difference was greatest for the 15-64 years age group. In addition, acute upper respiratory illnesses are not usually bacterial in origin nor by themselves indications for antibiotic medication. The prescribing variations first reported by Howie, however irrational, still apply.¹⁷

The overall prescribing of psychotropic drugs by trainees was substantially lower than that of principals though not for new prescriptions. Hasler reported major differences in the prescribing of antidepressants by trainees compared with principals.⁷ He considered this difference to be partly attributable to the failure of patients with mental disorders to attend the trainee for follow-up. The lower prescribing rate for trainees of continuing prescriptions for psychotropic drugs, the lower proportion of mental disorders seen and the reduced referral rate in

psychiatry in this study support his conclusion. The low rate for issuing repeat prescriptions raises questions about the involvement of trainees in repeat prescribing. There is considerable variation between practices in the organization of repeat prescribing, but since the number of repeat prescription forms issued is approximately equal to one-third of the total number of consultations¹⁸ this important part of a general practitioner's work must be given its appropriate place in a training programme.

Rates for referrals to hospital and patient investigations were slightly lower among trainees than principals. The differences in age pattern and morbidity of the patients seen by the two groups limits comment on this. The differences found were small.

It is apparent from these results how little change has taken place since the work of Richardson and Irvine.^{1,2} The warnings implicit then are still valid and have been substantiated by the results from a large data base. There can be no substitute for objective data from which performance can be measured and the differences between trainees and principals identified here provide essential material for planning the training year.

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Address for correspondence

Dr D.M. Fleming, Birmingham Research Unit of the RCGP, Lordswood House, 54 Lordswood Road, Harborne, Birmingham B17 9DB.

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