

the practice on digoxin (1.2 per cent compared with the 0.73 per cent of the authors' study) could be explained by the significant number of cases in my own study who clinically did not justify treatment with digoxin at all!

I am surprised at the authors' concern to establish the value of blood urea and serum creatinine levels in determining renal function as a guide to digoxin dosage. This has already been well documented by several others who consider creatinine clearance to be the most sensitive test of poor renal function. It is known that the digoxin clearance may be depressed before any elevation of blood urea nitrogen level (Bloom and Nelp, 1966; Mason, 1974; Hulka *et al.*, 1975; Brady, 1977; Dobbs *et al.*, 1977).

Drs Brown and Manning state that in their study the patients were weighed but no further mention is made in relation to specific doses of digoxin in the article. Yet weight is regarded as an important guide to dosage (particularly lean body weight) and a change in weight is often an indicator of early cardiac failure. The reduction in weight that elderly people experience with the passage of years may lead to digoxin toxicity, if they have been on the drug over a long period, owing to decreased muscle mass (the major depository of digoxin).

A further question concerns the presence of other disease entities and the use of other drug therapies among the authors' patients taking digoxin. They discuss taking drug histories from the patients but do not indicate if any other drugs were prescribed for different medical conditions. They do mention potassium supplements and diuretics, including furosemide, which is not only well known for its potassium depleting activity, but also for its tendency to produce hypokalaemic alkalosis (Frohlich, 1977). It is a powerful drug which probably should not be used with digoxin at all. There are, however, other products which affect the absorption and toxicity of digoxin. Alumina gels, magnesium trisilicate, kaolin-pectin mixtures, high fibre cereal, and cholestyramine absorb the drug while gastric uptake is affected by anticholinergic agents (Brady, 1977). Digoxin toxicity manifested by arrhythmias and symptoms can be precipitated by adrenergic drugs, reserpine, hypomagnesia, and hypercalcaemia. Phenytoin, propranolol, and procainamide enhance the action of digoxin.

Drs Brown and Manning also state that certain decisions were taken with regard to maintaining or altering digoxin dose, based on clinical judgement. This 'clinical judgement' is not defined in the article, although I have

the impression that it was related to the apical and radial pulse rates. A range of pulse rates regarded as clinically satisfactory by the authors would have been valuable in reviewing their analysis of the results.

I am concerned that the doses of digoxin were increased in a number of patients based on "sub-therapeutic" levels of digoxin in the serum in spite of the fact that some patients had reasonable pulse rates and were clinically normal. Recent evidence (Mason, 1974) has shown that there is a linear therapeutic dose to contractile response relationship, so that even small amounts of the glycoside provide therapeutic activity. This contradicts earlier opinions that there was minimal contractile benefit to the heart until a specific digitalising dose had been reached. One should not therefore be too closely bound by the so-called 2.6 n mol/l when assessing the clinical response of the patient and estimating the dose of digoxin.

(Incidentally, it is interesting to note that the cost of a serum digoxin estimate at this university hospital is £12 as opposed to £.085 by the authors of this article.)

I fully support the authors' conclusions resulting from their investigations. It would be interesting to speculate whether the results of creatinine clearance studies on all patients involved in this study would have led to further adjustment of the dosage of digoxin in their cohort of patients.

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#### References

- Bloom, D. M., Nelp, W. B. (1966). *American Journal of Medical Science*, **251**, 133-144.  
Brady, E. S. (1977). *Drug Therapy*, 71-82.  
Curtis, P. (1975). *British Medical Journal* **4**, 747-749.  
Dobbs, S. M., Kenyon, W. I., Dobbs, R. J. (1977). *British Medical Journal*, **1**, 749-752.  
Frohlich, E. D. (1975). *American Heart Journal*, **89**, 1-3.  
Hulka, H., Sheiner, L. B., Peck, C. C. *et al.* (1975). *Clinical Pharmacology and Therapeutics*, **17**, 385-394.  
Mason, D. T. (1974). *Annals of Internal Medicine*, **80**, No. 4, 520-534.

#### INNER CITY PRACTICE

Sir,  
Judging from the response to a brief

assertion I made at the College symposium, there is some support for my views. I wish to elaborate these points now.

So far as I am aware there has always been difficulty in attracting professionals to areas of great need. The attractions of life away from the inner city are felt not only by doctors but by teachers, lawyers, administrators, architects, and for all I know dustmen and dishwashers too. Where general practitioners differ is that the others may live in the commuter suburbs and do their jobs just as well, while we are thought to be shirking our responsibilities if we do so. If we do live in and serve slum areas then we must usually send our children to slum schools and run the risk of seeing their childhood blighted by being at best social outcasts, at worst juvenile outlaws.

We must compete for housing with the richest members of society whose efforts at 'gentrification' have raised the cost of buying and rehabilitating even the worst housing beyond our pockets. If practice premises are available we are unable to pay the prices which other businesses can. If they are not, then we must hope for the dubious benefit of health centre premises. Recent experience of arbitrary increases in health centre charges and the declared intention of one recent Secretary of State to deprive health centre doctors of rights of tenure puts me, and I am sure many others, off health centres.

Our staff too will expect city rates of pay and perks. Our ability to arrange this is limited both by our own income and the willingness of the family practitioner committees to accept their part of the burden. I know of two contemporaries who have left the profession to better themselves; both are vocationally trained, one is a member of our College. One deals in second-hand cars, the other runs a pop music recording studio. They both wanted to live in big cities and that is their solution to the cash-flow problem.

I do not know the solution but I am sure that it will have to be more than a simple diversion of funds into the health centre and district nursing budgets. Financial incentives to practise in deprived areas have failed because they are not high enough to pay for a decent house, let alone for private education. Until they are those who are attracted to city practice will not come.

It seems that the College has generally held itself aloof from the matter of personal incomes. When this was merely a question of deciding our level of luxury I think that this was correct. Now that income prevents us from buying houses and practice premises in ever-widening areas of our large towns I

feel that the College must become involved. Those who lead the profession mostly bought their first houses and practice premises 10 or 20 years ago; their children are educated—most of them privately or at grammar and direct grant schools—and their appreciation of the realities of setting up anew is remote.

The new intake of general practitioners know the problems all too well. I fear that before long there will quite simply be few, if any, NHS general practitioners in inner cities.

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### RUBELLA IMMUNIZATION

Sir,  
Further to the recent *Journal* articles and correspondence about rubella immunization I have offered rubella screening to 437 women student teachers, about to leave St Martin's College of Education, in the last two years. Two hundred and seventy-one (62 per cent) have responded and had blood taken at sessions organized jointly by Dr W. R. Falconer, Assistant Community Physician, and myself. We have found 48 non-immune students, 17.7 per cent of those screened. All women screened were in the 20 to 30 age group and only eight had previously been immunized. The full findings are shown in Table 1.

The one student previously immunized and shown as non-immune had a titre of 1:4, that is below the screening level of 1:16. She was re-immunized. The students found to be non-immune have all been informed of their 'at risk' state and 34 had received immunization at the time of writing.

We are aware that this is only a partially successful exercise with an estimated 30 women from the un-screened group going out into teaching, or other work, at risk to contract rubella possibly when pregnant.

If we continue screening we should find fewer non-immunes as those students immunized at the age of 12 reach their final year. However, Peckham and colleagues have shown that only 71 per cent of 12-year-old girls offered rubella immunization are responding. It seems, therefore, that with existing immunization and screening programmes the risk of congenital rubella in the community can only be reduced and not completely removed.

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### References

- Peckham, C. S., Marshall, W. C. & Dudgeon, J. A. (1977). *British Medical Journal*, 1, 760-761.  
Rose A. J. & Mole, K. F. (1976). *Journal of the Royal College of General Practitioners*, 26, 817-821.

### PRESCRIBING COSTS

Sir,  
From time to time general practitioners are sent a crude analysis of their prescribing costs, with local and national averages. I often wonder what should be the reaction of a doctor who finds that he is prescribing at half the normal rate and is saving the Exchequer £1,000 per month by his prescribing habits. Should he examine his habits in order to "do better next time", or should he perhaps expect to be allowed to spend this money in some other way for the real benefit of his patients?

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### MEDICINE IN THE EEC

Sir,  
I would like to thank Miss Lempelius

(November *Journal*, p.698) for pointing out that health insurances or *Krankenkassen* are nearly all government run and apologize for missing out the *Kassenärztliche Vereinigung* (equivalent to our family practitioner committee) in the transfer of item-of-service fees from *Krankenkassen* to doctor.

My choice of general practitioner was quite at random and I was impressed. Our ten-doctor centre does not have one laboratory technician.

I noted that although Miss Lempelius works with doctors she did not find one to refute my impression.

Our two health services are so different. When a West Germany doctor walks through his full waiting room, he is pleased. When a British doctor does likewise, his heart sinks!

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### OTITIS EXTERNA AND SWIMMING POOLS

Sir,  
The article by Dr Weingarten (*July Journal*, p.359) highlights an important problem. I had to investigate a similar incident causing considerable morbidity among soldiers serving in Belize (French, 1971).

An important contributory fact was the rapid loss of chlorine from the water under conditions of high intensity ultraviolet irradiation and high ambient temperature. The quantity of liquid chlorine required to maintain adequate chlorination in the open air pool was ten times greater on days when the sky was clear compared to days when the sky was overcast.

In order to maintain adequate chlorination while avoiding the irritant effect of excess chlorine, almost continuous monitoring was required. This expensive, time-consuming activity was more than warranted by the reduction in

Table 1. Results of screening programme.

Blood	Rubella/immunization history									Totals		
	Rubella +ve			Rubella -ve			Immunized			1976	1977	Total
	1976	1977	Total	1976	1977	Total	1976	1977	Total	1976	1977	Total
Immune	64	58	122	46	42	88	7	6	13	117	106	223
Non-immune	2	6	8	20	19	39	1	0	1	23	25	48
Totals	66	64	130	66	61	127	8	6	14	140	131	271