Community electrocardiography

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SUMMARY. The report of the Joint Working Party on General Medical Services (1973) considered in detail the provision of electrocardiographic services for general practitioners. These are based either on primary health care teams using their own apparatus, or on hospitals offering open-access to their cardiac departments.

In this survey I attempted to compare the proportions of general practitioners using their own electrocardiographs with those using hospital-based apparatus, and with those without direct access to any electrocardiograph facilities, and to evaluate the use made of such services, when available.

Method

A brief reply-paid postcard was sent to 1,000 general practitioners chosen systematically from the *Medical Directory*. A response rate of about 75 per cent was achieved, representing 1,875 individual general practitioners. A final question on this card invited respondents to participate in a much fuller survey, the purpose of which was to assess details of the type of practice in each category, and the methods of use, by individual practices, of the facilities available.

Results

TABLE 1
GENERAL PRACTITIONERS OWNING ECG MACHINES

Number of general practitioners with own apparatus	=	261 replies (*34%*) representing 964 general practitioners (*51%*)
Number of general practitioners with open access	=	396 replies (*52%*) representing 804 general practitioners (*43%*)
Number of general practitioners with no ECG service	=	195 replies (*25%*) representing 414 general practitioners (*22%*)

86 replies (*11%*) representing 307 general practitioners (*16%*) have both their own electrocardiographs and open-access service. These are included in both categories in table 1, but subsequently included only among those using their own apparatus.

Just over half the general practitioners in the survey have the use of electrocardiographs within their own practice, while of the remainder, just over half have access to hospital cardiac departments, while just under a quarter of all general practitioners have no ECG service at all.

This shows a marked change from previous findings.

TABLE 2
CHANGING ACCESS TO ECGS WITH TIME

	Cartwright (1963)	*Irvine and Jefferys (1969)*	*This survey (1974)*
Own ECG percentage	—	*10*	*34*
Open access percentage	*10*	*40*	*52*

Size of partnership

Eighty-six per cent of general practitioners with their own apparatus are in partnerships of three or more, while only 60 per cent without their own apparatus are in partnerships of that size.

Size of practice lists

There is no significant difference in average list sizes between practices in the different categories.

TABLE 3
OWNERSHIP OF ECG MACHINES RELATED TO NUMBER OF PARTNERS

Number of partners	1	2	3	4	5	6 *or more*
Own ECG percentage	*4*	*10*	*30*	*20*	*19*	*17*
Open access percentage	*19*	*22*	*26*	*21*	*8*	*4*
No facilities percentage	*21*	*16*	*29*	*22*	*4*	*7*

TABLE 4
ACCESS TO ECG RELATED TO LIST SIZE

Size of average list	*Less than* 1599	1600 *to* 1899	1900 *to* 2499	2500 *to* 2999	3000 *to* 3399	3400 *to* 3599	*More than* 3600
Own ECG percentage	*11*	*2*	*17*	*28*	*24*	*8*	*9*
Open access percentage	*12*	*4*	*25*	*13*	*24*	*12*	*9*
No facilities percentage	*7*	*5*	*21*	*25*	*19*	*9*	*14*

Age of doctors

Seventy per cent of general practitioners with their own apparatus are under 50, while only 50 per cent of those without their own apparatus are under that age.

TABLE 5
ACCESS TO ECGS RELATED TO AGE OF DOCTOR

Age	*Less than* 29	30 *to* 34	35 *to* 39	40 *to* 44	45 *to* 49	50 *to* 54	55 *to* 59	60 *to* 64	*More than* 65
Own ECG percentage	*2*	*12*	*14*	*18*	*24*	*22*	*6*	*2*	*1*
Open access percentage	*2*	*5*	*17*	*15*	*12*	*30*	*12*	*7*	*1*
No facilities percentage	*3*	*5*	*10*	*15*	*14*	*27*	*14*	*10*	*3*

Dates of qualification

As would be expected, the dates of qualification correspond closely with the ages of the doctors in the survey. I thought it would be interesting to see whether there was any correlation between the length of time between qualification and establishment in general practice, for those in each category, qualifying after 1950, but none was discovered.

TABLE 6
ACCESS TO ECGS RELATED TO TYPE OF PRACTICE

(*a*)	*Urban*	*Semi-rural*	*Rural*	(*b*) *Health centre*	*Group surgery*	*Individual surgery*
Own ECG percentage	*46*	*32*	*22*	*24*	*59*	*16*
Open access percentage	*57*	*22*	*21*	*19*	*53*	*28*
No facilities percentage	*60*	*27*	*13*	*20*	*38*	*42*

Practice characteristics

From these results it is possible to identify some characteristics of general practitioners who are likely to have their own electrocardiographs. They are likely to be below the average age of general practitioners as a whole, in a partnership of three or more, working from a health centre or group practice premises, in a rural or semi-rural practice.

In the next stage of the survey, different, but broadly similar questions were asked of the general practitioners in each category.

Those with their own apparatus were asked the source of their machine.

TABLE 7
SOURCES OF MACHINES (PER CENT)

Bought new	*52*
Other sources	*16*
Provided as health centre equipment	*15*
Bought secondhand	*10*
Hired	*7*

Most of the general practitioners using their own apparatus have bought them new, and they belong to the whole practice, although a considerable number had acquired them from ' other sources ', often local charitable organisations. It is surprising that less than a quarter of those practising from health centres use apparatus provided by the local authority.

TABLE 8
DOCTORS REQUESTING RECORDINGS

Recordings requested by:	*Per cent*
All partners	*71*
Some partners	*16*
One partner mainly	*9*
One partner entirely	*4*

TABLE 9
INDIVIDUAL TAKING THE TRACINGS

Tracings made by:	*Per cent*
Practice nurse	*33*
All partners	*25*
Some partners	*18*
One partner mainly	*10*
Anyone else	*8*
One partner entirely	*6*

TABLE 10
DOCTOR READING RECORDINGS

Recordings read by:	*Per cent*
Some partners	*30*
All partners	*29*
One partner mainly	*19*
One partner entirely	*11*
Consultant cardiologist (always)	*9*
Anyone else	*2*

(In addition in *27%* of practices the assistance of a consultant cardiologist was called upon occasionally)

In nearly half the practices the practice nurse (or another non-medical member of the practice team) takes the recording.

While in most of the practices most partners consider that they have the skill to read the tracings, in over a quarter arrangements have been made with local consultants for help if necessary.

Broadly similar questions were asked of those using hospital-based apparatus. This showed that while the Joint Working Party (1973) recommended that " general practitioners should always be provided with a report by a suitably experienced member of the medical staff of the hospital " in fact 27 per cent have to read the hospital tracings themselves, as these alone are returned to them. In 35 per cent of cases, however, the tracings are not returned to the general practitioner, only the consultant's report being available.

From the point of postgraduate education, I thought that it would be interesting to discover how the skill required for the interpretation of ECGs had been obtained.

TABLE 11

SOURCE OF SKILL

	Postgraduate course	*Attachment to cardiology unit*	*Self instruction*
Own ECG	27	14	60
Open access	23	16	61

Those using their own apparatus were asked where the apparatus is most frequently used, whether it is used for recording ECGs for other practices or for routine screening.

TABLE 12

COMMONEST USE OF MACHINE

Most frequently used in surgery during normal hours	=	*40%*
Most frequently used in patients' homes	=	*34%*
Most frequently used in surgery during special ECG sessions	=	*34%*
Used for screening sessions	=	*26%*
Used occasionally for other practices	=	*13%*

In contrast, only 18 per cent of general practitioners using hospital-based apparatus are able to arrange domiciliary ECG recordings (in the absence of a consultant) and only 16 per cent think that it would be possible to use the hospital service for screening sessions.

In 18 per cent of practices using their own apparatus, the tracings are kept in a separate file, and 17 per cent of these practices keep an index of patients who have had ECGs. The corresponding figures for practices using hospital-based apparatus are five per cent and four per cent respectively.

Finally I felt it would be interesting to know why general practitioners decided to buy electrocardiographs and whether, as a whole, the practitioners in this survey are satisfied with the services they have.

TABLE 13

CLINICAL INDICATIONS IN GENERAL PRACTICE FOR ECG USE

70% obtained ECGs primarily for diagnosis of acute chest pain.
14% obtained ECGs primarily for diagnosis of chronic or recurrent chest pain
7% obtained ECGs primarily for evaluation of cardiac arrhythmia
6% obtained ECGs primarily for other reasons
2% obtained ECGs primarily for screening purposes
1% obtained ECGs primarily for assessment of hypertension

Of those doctors with their own apparatus, 62 per cent think that it is as useful as they had hoped while 21 per cent find it more useful. The remaining 17 per cent think it is less useful.

In contrast 78 per cent of general practitioners using hospital-based apparatus are satisfied with the system in their area. The chief causes of dissatisfaction are principally the delay in making appointments, or receiving reports, or the impossibility of arranging domiciliary ECGs.

Of general practitioners with no access at all to ECGs, 72 per cent find it an inconvenience while 90 per cent feel that they would use an open-access service if available. Twenty-one per cent are considering buying their own apparatus compared with 17 per cent of those using a hospital-based service.

Discussion

The general satisfaction shown by those using hospital-based apparatus should not blind us to the very real drawbacks of this sort of service.

Only a small proportion of these are available as a domiciliary service (Peniket and MacQuaide, 1973). This immediately rules out the use of this service in any patient suspected of having had an acute myocardial infarction, which a large proportion of those using their own apparatus considered the most important reason for having an electrocardiograph.

The limitation of ECGs for evaluating chronic or recurrent chest pain is well known (Short, 1968), as a normal tracing does not rule out ischaemic heart disease, if no exercise test has been done (and very few ECG departments will do this test unless a doctor is present).

Several articles have been written on open-access schemes (Baird *et al.*, 1973; Lorimer and Kennedy, 1968; Morgan *et al.*, 1970; Short, 1969) and on the uses of the electrocardiograph within general practice (Blacklay, 1968; Evans *et al.*, 1973; Samuel, 1969). These show that it is well within the competence of the primary health care team to organise its own service, and to interpret the tracings itself. However, this also presents its own problems in expense, time, and the skill involved in interpreting tracings.

There is no doubt that while many large partnerships consider the money invested in ECG machines to be worthwhile; for the small practice or single-handed practitioner, such an expense may appear to be unjustified, especially if the apparatus is going to be used only rarely. Perhaps consideration should be given by the Department of Health and Social Security to some form of reimbursement, possibly as an item-of-service payment? After all electrocardiographs done in general practice save the hospital service money, both in technician and consultant time.

The time involved in recording ECGs is short and becomes shorter with experience. In nearly half the practices questioned this is done by the practice nurse, or another non-medical assistant, and this is certainly another technique that can add interest to her work.

The time and the skill involved in interpreting the tracings is another aspect altogether and I suggest that this is the factor which stops many doctors obtaining their own apparatus. The experience of those who read their own tracings shows, however, that these are not insuperable problems, and in every group practice or health centre there should surely be one practitioner who could become proficient at interpretation, especially if there is consultant support if needed.

Stevens (1965) described an ideal way for general practitioners to learn the interpretation of electrocardiograms, but for those without enough time for a full attachment to a cardiology unit there is probably need for more postgraduate courses in ECG interpretation. Nearly two thirds of the doctors involved have taught themselves. This appears to be too high a proportion.

One of the most valuable advantages of a practice-based service is that it enables the practice to build up a library of ECG tracings, as many more recordings will be done than if the patients are referred to hospital, and these, whether normal or abnormal, will be a valuable source of reference at a later date, as they can be compared with subsequent tracings in the same patient, and recent abnormalities easily detected.

Conclusion

The enormous increase in the number of practices using their own apparatus since 1969 (table 2) suggests that within ten years the group practice without its own apparatus will become a rarity. If this is so, surely this is the time to consider a gradual reduction of open-access services with their considerable limitations.

The increasing use of electrocardiographs by primary health care teams will lead to less demand on hospital cardiological clinics, which will be able to deal with the patients referred by those who, for any reason, do not wish to use their own apparatus.

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