interfere with normal swallowing, and can be classified according to the underlying mechanism into three categories: oesophageal lesions (stricture), neuromuscular disturbances (myasthenia gravis), and extrinsic mechanical hindrance (ankylosing spondylitis). In elderly edentulous patients inadequate mastication may be a sufficient explanation for impaction of an abnormally large bolus of food. Also, wearing artificial dentures, especially the full upper denture, can obliterate tactile sensation in the roof of the mouth so that bones and other sharp objects are not detected until they have entered the oropharynx.²

It is not surprising that impacted food is the commonest foreign body in adults and elderly patients while coins rank first on the list in children. Children of all ages have the habit of putting coins into their mouths and can inadvertently swallow them.

In most children the foreign body is impacted in the upper oesophagus at the level of cricoid cartilage, which is the narrowest part of the oesophagus. This is followed by the mid-oesophagus where it is crossed by the aortic arch and left bronchus and the lower oesophagus where it pierces the diaphragm.³ In adults the bolus of food is usually impacted in the lower oesophagus or at the site of the underlying lesion. A large solid bolus, such as poorly chewed meat, is usually impacted in the lower oesophagus.⁴

The diagnosis of a radio-opaque foreign body in the oesophagus can be confirmed by a chest x-ray examination (antero-posterior and lateral), while a barium meal examination can be used to localize impaction by other objects. Whenever an oesophageal foreign body is diagnosed it should be removed by oesophagoscopy. Blind methods, such as probing the pharynx with a finger or passing catheters, hooks, etc., are not advisable. Turning the patient upside down or pounding him between the shoulder blades can have little if any effect on an oesophageal foreign body.⁵

In all patients attempts to remove the foreign body were by oesophagoscopy under general anaesthesia. Local anaesthesia can be used for adults and is particularly advisable when the underlying factor is expected to predispose to complicated general anaesthesia.

In adequately prepared children recently impacted coins at the upper oesophagus may be removed by oesophagoscopy without tracheal intubation. In other patients, however, an endotracheal tube must be inserted to provide an adequate airway during oesophagoscopy, and to minimize the incidence of aspiration of saliva, food, and other material accumulating in the oesophagus above the impacted foreign body and the predisposing lesion.

The tracheal tube comes out at the left side of the mouth, leaving the pyriform sinus and the laryngopharynx available to the endoscopist. Overinflation of the tracheal tube cuff can create extrinsic pressure on the oesophagus and interfere with oesophagoscopy and manipulation of the foreign body. Excessive positive pressure ventilation can also cause the oesophagus to compress the foreign body, increasing the degree of impaction or even leading to perforation of the oesophagus.⁵ Perforation can also result from oesophageal manipulation, particularly when a foreign body is firmly impacted in a diseased oesophagus. Mediastinitis and mediastinal emphysema can follow and result in serious complications. Complications are more common in adults than in children, which can be attributed to the presence of underlying disease in most patients of the adult age group.

We thank our colleagues in the anaesthesia, ear, nose, and throat, and x-ray departments of the American University of Beirut for their co-operation and advice.

References

- ¹ Barake, A., *British Journal of Anaesthesia*, 1974, 6, 124.
- ² Jackson, C. L., *American Journal of Surgery*, 1957, 93, 308.
- ³ Gray, H., *Gray's Anatomy*, 32nd edn., p. 1393. London, Longmans Green, 1958.
- ⁴ Paul, L. W., and Juhl, J. H., *Essentials of Roentgen Interpretation*, 2nd edn., p. 393. New York, Harper and Row, 1965.
- ⁵ Gabriel, F., and Tucker, J. R., in *Management of Esophageal Disease. Modern Treatment Volume 7*, No. 6, ed. T. M. Bayless, p. 1301. New York, Harper and Row, 1970.

General Practice Observed

A Health Centre E.C.G. Service: Its Use and Abuse

T. FYFE, N. M. MACLEAN

British Medical Journal, 1975, 1, 563-566

Summary

An average of 10.5 E.C.G.s were recorded weekly in a health centre used by 32 general practitioners serving a population of almost 65,000. The main indication for an E.C.G. was chest pain (73%). 47% of the E.C.G.s were abnormal. A change in clinical diagnosis occurred in 28% of cases and in patient management in 16%. A

significant number of these changes were unwarranted, however.

It is recommended that the E.C.G.s should be recorded by suitably trained nurses and reported by a specially trained general practitioner. Further education of general practitioners in the clinical use of the E.C.G. is required.

Introduction

There are several surveys analysing the indications for and abnormalities found in electrocardiograms (E.C.G.) carried out by general practitioners themselves¹⁻³ and by hospital services for general practitioners.⁴⁻⁹ There does not appear to be any information published on how they use an E.C.G. service in the management of their patients apart from those of Morgans *et al.*¹⁰ and Peniket and MacQuaide,¹¹ both of which were carried out retrospectively. This topic has become important as

Vale of Leven District General Hospital, Alexandria, Dunbartonshire, G83 0AU

T. FYFE, M.D., M.R.C.P., Consultant Physician

Clydebank Health Centre

N. M. MACLEAN, M.B., M.R.C.G.P., General Practitioner

a result of the development of health centres with E.C.G. facilities directly available to general practitioners, particularly as there have been doubts raised about their ability to use E.C.G.s profitably.^{12 13}

Patients and Methods

A prospective study was organized in the Clydebank Health Centre to determine how G.P.s use the E.C.G. in the management of their patients. The Clydebank Health Centre serves a population of approaching 65 000 looked after by 32 G.P.s. We studied 300 consecutive E.C.G.s requested for 298 patients by 28 of the G.P.s over a period of 29 weeks. One hundred and ten E.C.G.s were recorded from females and 190 from males. The mean age ($\pm$ standard deviation) of the females was 54 ± 12 and of the males 51 ± 13 years. The E.C.G.s were carried out by seven nurses, of whom four had been trained in the technique of E.C.G. recording by cardiographers at a teaching hospital. It was planned that the E.C.G. would be carried out immediately on request.

The E.C.G. request form opposite allowed assessment of the general practitioner's diagnosis and intended management. All the E.C.G.s were reported by a consultant physician and by a G.P. particularly interested in E.C.G. interpretation. The consultant E.C.G. report was returned with the tracing together with the E.C.G. report form to be filled up by the G.P., the E.C.G. request form having been retained in the E.C.G. department. The E.C.G. report form contained sections for "final diagnosis" and "actual management" which were identical to the "presumptive diagnosis" and "intended management" sections of the E.C.G. request form. By subsequently comparing the E.C.G. request form and the E.C.G. report form it was possible to determine whether there had been any change in diagnosis or in management of the patient as a result of the E.C.G. report.

E.C.G.s were reported on by reference to the criteria set out by M. J. Goldman.¹⁴ A policy of under-reporting was adopted, minor ST-T changes being ignored.

Results

The average number of E.C.G.s was 10.5 per week, ranging from 4 to 17 per week. Though it was planned that the E.C.G.s would be done immediately on request, this was achieved only in 66%. There was evidence that the number of delays increased during the period of the study, as 85% of the first 100 E.C.G.s were done immediately but only 58% of the subsequent 200.

The commonest indication for an E.C.G., as might be expected, was chest pain (76%). Breathlessness was an indication in 37% (chest pain along with breathlessness accounted for 25%). Surprisingly, "routine medical examination" was given as the

E.C.G. Request			Doctor's Stamp
Surname	First Names	H.C. Number	
Age	Sex	Date	

(Circle appropriate answer)

B.P.:-

Digitalis:- Yes/No

Reason for E.C.G.:- Chest pain/breathlessness/ankle swelling/palpitations/
murmurs/hypertension/reassurance

Previous Infarct:- Yes/No

Presumptive Diagnosis:- 1) Angina:- Definite/probable/absent
2) Recent Infarct:- Definite/probable/absent
3) Other diagnoses:- (specify)

Intended Management:- 1) Hospital admission/bed rest/drugs:-
2) Reassurance - no heart disease/
told has heart disease

reason for the E.C.G. in only 1% and "reassurance" in only 2%. 47% of E.C.G.s were abnormal. 20% showed evidence of myocardial ischaemia and 13% of myocardial infarction. An arrhythmia as the sole abnormality occurred in 7%, and left ventricular hypertrophy was found in 4%.

Changes in diagnosis or management or both were assessed according to the E.C.G. report. An E.C.G. report of myocardial infarction was given in 39 cases. In 17 of these the E.C.G. request form indicated that this was not expected. Table I shows the changes in diagnosis in these 17 patients. In 11 of these 17 cases a recent myocardial infarction was diagnosed by the G.P. as a result of the E.C.G. alone, there being no clinical suspicion of it. The diagnosis was not accepted as being definite in 10 of these 11, attributable in seven cases to the E.C.G. report reading "probable acute myocardial infarction" or "probable sub endocardial infarction." The two patients with a pre-E.C.G. diagnosis of "absent angina" did not present with chest pain, and therefore the maintenance of that diagnosis is understandable.

General practitioners failed to alter the management in 8 (47%) of the 17 cases in whom the E.C.G. diagnosis was not expected. In three of these cases, however, the patient was already advised to rest in bed, in two cases the patient had not had any chest pain and the infarct was considered by the G.P. not to be recent; and in one case arrangements were made for the E.C.G. to be repeated. However, in the two remaining cases the indication for the E.C.G. was chest pain and the G.P. accepted the diagnosis of "probable recent myocardial infarction" yet the management did not alter. In contrast in patients in whom myocardial infarction was suspected before the E.C.G. there were changes in management in six (27%). Admission to hospital was arranged for two patients, two patients were treated with bed rest at home, and two were simply told they had heart disease.

TABLE I—Changes in Diagnosis following an E.C.G. Report of Myocardial Infarction in 17 Patients in whom the Possibility of Myocardial Infarction had not been Suspected

Initial Diagnosis/Final Diagnosis	Definite Recent Infarct	Probable Recent Infarct	Definite Angina (Old Infarct)	Probable Angina	Absent Angina
Definite angina	0	0	1	0	0
Probable angina	1	9	3	0	0
Absent angina	0	1	0	0	2

TABLE II—Changes in Diagnosis Following an E.C.G. Report of Myocardial Ischaemia

Initial Diagnosis/Final Diagnosis	Definite Recent Infarct	Probable Recent Infarct	Definite Angina	Probable Angina	Absent Angina
Probable recent infarct	2	3	2	0	1
Definite angina	0	1	13	0	0
Probable angina	0	2	13	12	0
Absent angina	0	0	1	5	5

TABLE III—Changes in Management following an E.C.G. Report of Myocardial Ischaemia

Initial Diagnosis/Actual Management	Unchanged	Informed of Heart Disease	Hospital Admission Not Proceeded With	Bed Rest
Probable recent infarct	4	0	3	1
Definite angina	12	1	0	1
Probable angina	15	12	0	0
No angina	8	3	0	0
Total	39	16	3	2

TABLE IV—Changes in Diagnosis following a Normal E.C.G. Four Normal E.C.G.s have been Excluded from Analysis because the Proforma was not Completed Properly

Initial Diagnosis/Final Diagnosis	Probable Recent Infarct	Definite Angina	Probable Angina	Absent Angina
Probable recent infarct	2	1	1	4
Definite angina	0	2	2	1
Probable angina	1	0	28	29
Absent angina	0	0	0	80

Table II shows how an E.C.G. report of myocardial ischaemia influenced the G.P.'s diagnosis. The diagnostic shift from "probable recent infarct" to "absent angina" is inexplicable. Again the maintenance of a diagnosis of "absent angina" in three patients without chest pain after an E.C.G. report of myocardial ischaemia is possibly explained by the absence of the diagnostic category "ischaemic heart disease" on the form. In the other two patients in this category who presented with chest pain not thought to be cardiac, but which was thought to be an indication for an E.C.G., the failure to accept a diagnosis of angina is perhaps surprising. The diagnostic shift from "probable recent infarct" to "definite recent infarct" in the face of an E.C.G. showing only myocardial ischaemia is difficult to understand and may have been made on some other criteria, but this was not stated in the proforma.

The main change in management occurring on receiving an E.C.G. report of myocardial ischaemia (table III) was that the patients were told that they had heart disease. It should be noted that patients who had been told they had heart disease before the E.C.G. was done were included in the "no change" category. In fact 86% in the "definite angina" group had been told they had heart disease before the E.C.G. was recorded compared to 26% in the "probable angina" group. The decision not to send three patients, thought to have sustained a recent infarct on clinical grounds, to hospital as a result of failure to find evidence of myocardial infarction on the E.C.G. is a misuse of the E.C.G. resulting from a failure to understand that a single E.C.G. cannot exclude myocardial infarction. A report that the E.C.G. was normal led to similar problems, as can be seen from table IV. Four patients thought to have sustained a recent myocardial infarction were diagnosed as "absent angina" after a normal E.C.G. In 50% of cases diagnosed before the E.C.G. as "probable angina" the final diagnosis was "absent angina" yet again representing an overestimation of the value of the E.C.G. The change from "probable angina" to "probable infarct" in spite of a normal E.C.G. report is explained by the fact that the patient had had a previous E.C.G. which was abnormal, and the G.P. concerned thought that the improvement implied previous infarction.

Changes in management resulted from a normal E.C.G. report in 17% of patients suspected of having ischaemic heart disease. Two patients diagnosed as "probable recent infarct" and one patient diagnosed as "definite angina" on clinical grounds were told they had no heart disease following a normal E.C.G. report. A further striking feature was the failure to change the patient's management in 93% of the "probable angina" group in view of the willingness to change the diagnosis in this group to "absent angina." This was due to the vast majority of G.P.s' reassuring the patient that there was no heart disease in spite of suspecting it, and continuing this reassurance on receiving the report that the E.C.G. was normal.

Fifteen out of the 32 G.P.s in the health centre requested more than 10 E.C.G.s. These G.P.s in fact ordered 83% of the total. The use of the E.C.G. by this group of "high users" did not differ in any way from the other 13 "low users" (4 G.P.s did not request any E.C.G.s).

G.P. and consultant reports differed in 4% of cases. These differences were due to a tendency of the G.P. to over-report minor ST changes.

Discussion

The indications for E.C.G.s, the proportion abnormal, and the abnormalities found are remarkably similar to those in other published studies (referred to in the Introduction). The important findings in this paper, however, concern the role of the E.C.G. in the management of patients. The data we have obtained suggest that the G.P. overestimates the value of the E.C.G. in excluding myocardial infarction and angina.

We recognize that there are limitations in this questionnaire type of investigation. Three main problem areas are evident. Firstly, doctors in general dislike filling up forms. Some of the inexplicable results may have been due to carelessness resulting from this dislike—for example, the change in diagnosis from "probable recent infarct" to "definite recent infarct" in spite of an E.C.G. reporting only "myocardial ischaemia." We realized this problem when planning the study and tried to make the forms as brief and as easy to fill up as possible. This has led to a second problem—namely, that we did not include a diagnostic category of "ischaemic heart disease" to cater for those patients with an ischaemic E.C.G. who did not present with chest pain and therefore were still diagnosed as "absent angina." It would have been possible for the G.P. to write the diagnosis in the "other diagnosis" section, but this would have required more effort. The third and largest problem is variation in interpretation of the request form by different G.P.s. Some G.P.s may have circled "probable angina" merely to indicate the area in which an E.C.G. abnormality was to be sought, even when they thought the diagnosis extremely unlikely. The fact that in general they tended to reassure this group of patients they had no heart disease supports this concept. The diagnostic shift from "probable angina" to "absent angina" on receiving a normal E.C.G. report may in these circumstances have some logic, but what we would criticize is the use of the E.C.G. to decide the problem. A further potential problem might have been that a G.P. might not have accepted the E.C.G. report, interpreting the tracing in some other way, but we do not think, having spoken to the G.P.s, that this was a factor.

Patient convenience is the main argument in favour of a health centre E.C.G. service against a hospital-based service. For it to be effective, however, the E.C.G. would have to be

recorded immediately on request to save the patient a return visit. As can be seen from our data, there was an increasing tendency for delays to occur owing to the nurses being too busy doing other things. There certainly would not be enough work to justify employing an E.C.G. technician fulltime, so the best solution would be to give E.C.G. recording higher priority in the nurses' duties. If it was accepted that the E.C.G.s could be done on an appointment basis, then it would be worth employing an E.C.G. technician part-time as this would raise the quality of the tracings. However, this would annul the great advantage in patient convenience which the health centre E.C.G. service provides over a hospital-based service.

It is clear that a suitably trained G.P. can report E.C.G.s, adequately and the intention is for the health centre to employ this G.P. to report the E.C.G.s. The main problem, however, is not the interpretation of the E.C.G. tracings but how E.C.G. reports influence clinical decisions in general practice.

We wish to thank Dr. J. Morris and Mrs. L. A. Speir for

providing secretarial help and Dr. J. F. Robinson for advice and encouragement.

References

- Blacklay, F. W., *Practitioner*, 1968, **200**, 577.
- Evans, E. O., et al., *Journal of the Royal College of General Practitioners*, 1973, **23**, 743.
- Henderson, J. M., *Journal of the Royal College of General Practitioners*, 1974, **24**, 243.
- Lorimer, A. R., and Kennedy, J. A., *Scottish Medical Journal*, 1968, **13**, 223.
- Seymour, J., Conway, N., and Bridger, E., *British Medical Journal*, 1968, **1**, 305.
- Dawson, K. P., *Practitioner*, 1969, **203**, 70.
- Short, D., *Scottish Medical Journal*, 1969, **14**, 305.
- Verel, D., *Journal of the Royal College of Physicians of London*, 1971, **5**, 275.
- Baird, H., Scott, M. E., and Webb, S. W., *Update*, 1973, **6**, 601.
- Morgans, C. M., et al., *British Medical Journal*, 1970, **1**, 41.
- Peniket, J., and MacQuaide, D. H. G., *Journal of the Royal College of General Practitioners*, 1973, **23**, 352.
- Edmonds, F. F., *Journal of the Royal College of General Practitioners*, 1967, **13**, 125.
- Short, D., *British Medical Journal*, 1970, **1**, 560.
- Goldman, M. J., *Principles of Clinical Electrocardiography*. California, 1973.

Any Questions?

We publish below a selection of questions and answers of general interest

Recurrence Risk of Cleft Palate

A woman whose first child—a boy—has bilateral hare lip and a cleft palate is worried about the risk of further children being born with this deformity. A maternal cousin and a paternal cousin of hers—both boys—also had hare lips.

The recurrence risk where two normal parents have had one child affected with cleft lip (with or without cleft palate) is of the order of 4%.¹ The recurrence risk varies with the severity of the malformation and after a child with bilateral cleft lip and palate it is between 5 and 6%. This risk would not be raised appreciably by the presence of cleft lip in the cousins of the mother.

¹ Carter, C. O., in *Progress in Medical Genetics*, vol. 4, ed. A. G. Steinberg and A. G. Bearn. London, Heinemann, 1966.

Gammaglobulin and Rubella in Pregnancy

Is gammaglobulin of proved value in treating pregnant women who have been in contact with rubella?

A history of rubella which rests solely on a clinical diagnosis has been shown to be poorly correlated with the presence of circulating antibody.¹⁻³ Thus, all women who are exposed to, or apparently infected with, rubella during early pregnancy should be subjected to appropriate serological tests.^{4, 5} Many studies of the effectiveness of human normal immunoglobulin (gammaglobulin) have been carried out in the protection of the fetus. Some of the earlier work indicated that normal immunoglobulin might be of some benefit⁶⁻⁸ though more recent studies concluded that any such benefits were small.⁹ The effectiveness of normal immunoglobulin is likely to depend on several factors—the time of administration in relation to exposure to the virus, the dose, and the titre of rubella specific antibodies of the immunoglobulin, which in turn is dependent on the immune status of the donors from which the material was drawn. Immunoglobulin with a high titre of rubella antibodies has been shown to be much more effective than low titre material.¹⁰ It is preferable, however, to rely on the results of serological investigation of "at risk" patients (leading to termination of

pregnancy when indicated) than on the uncertain benefits conferred by normal immunoglobulin, which may also delay maternal antibody responses¹¹ and obscure the interpretation of the results of serological tests.

Svedmyr, A., Lundstrom, R., and Thoren, C., *Archiv für die gesamte Virusforschung*, 1967, **22**, 48.

- Freeston, D. F., and Gatherer, A., *Medical Officer*, 1970, **123**, 205.
- Freestone, D. S., et al., *Medical Officer*, 1971, **125**, 281.
- Banatvala, J. E., et al., *British Medical Journal*, 1970, **3**, 247.
- Banatvala, J. E., *Postgraduate Medical Journal*, 1972, **48**, Suppl. 3, p. 11.
- McDonald, J. C., *British Medical Journal*, 1963, **2**, 416.
- Sever, J. L., Nelson, K. B., and Gilkeson, M. R., *American Journal of Diseases of Children*, 1965, **110**, 395.
- Butler, N. R., et al., *British Medical Journal*, 1965, **2**, 1027.
- Macrae, A. D., et al., *British Medical Journal*, 1970, **2**, 497.
- Schiff, G. M., *American Journal of Diseases of Children*, 1969, **118**, 322.
- Forrest, J. M., Honeyman, M. C., and Murphy, A. M., *Medical Journal of Australia*, 1973, **1**, 745.

Haemospermia

A patient passed a moderate quantity of blood per urethram while having an erection. There was no emission of semen, and no abnormality was found on examination. Was the bleeding caused by the rupture of a blood vessel due to engorgement?

Blood mixed with semen—haemospermia—is quite common, and hardly ever has any serious import. Once I saw it in an octogenarian who was subsequently proved to have prostatic carcinoma, and once in a young doctor who was found (two years later) to have a tumour of the testicle. In both instances the haemospermia was probably coincidental. As a general rule the symptom can be safely disregarded and the patient reassured. There is no reason to subject the patient to endoscopy, and if possible one should avoid making the diagnosis of "prostatitis." In the case described here, however, it sounds as if there might be some lesion in the urethra which had bled on erection, since there was no ejaculation. This is a symptom which ought to be investigated by urethroscopy and cystoscopy, since urethral bleeding may signify carcinoma of the urethra, the bladder, or the prostate. It would be dangerous to assume that the bleeding was caused by rupture of some small and innocent vessel until more serious conditions have been excluded.