Diagnostic procedures and the general practitioner

H. R. PATTERSON, M.A., M.R.C.G.P., D.Obst.R.C.O.G.
General Practitioner, Leicester

R. C. FRASER, M.R.C.G.P.
General Practitioner, Leicester

EILEEN PEACOCK, B.Tech.
Lately, Research Associate, Department of Engineering Production, University of Birmingham

The general practitioner should have free and direct access to laboratories and radiological departments of the local district hospital. The case for this has been well stated (Royal College of General Practitioners, 1970) and is now accepted (Irvine and Jefferys, 1971).

The scarcity of adequate data and the absence of joint planning has meant that the pattern of development of outpatient services, both diagnostic and therapeutic does not always make effective use of either the hospital consultant or the general practitioner (Scott and Gilmore, 1966).

We sought to examine in detail the way in which a group of doctors made use of diagnostic services available to them and to relate this to the clinical management of their patients.

Several estimates have been made of the amount of pathological and radiographic assistance required by general practitioners and wide variations have been noted (Morrison and Riley, 1963). The need for further information for planning the development of services in the future is recognised (Carstairs and Skrimshire, 1968). There is little published information about a doctor's reason for requesting special tests, the means whereby a specimen was obtained, its delivery to the appropriate department, the time taken for the results to be received, or details of the effect which an investigation had in the practical management of patients. This study was designed to answer these questions and this information will be of value in assessing the general practitioner's technical requirements.

Method

All requests for pathological or x-ray investigation made by a group of doctors during a period were identified. A questionnaire was completed for each request recording information both objective and subjective. This investigation was part of a larger project which recorded all requests made to the hospital services at the same time and comprised an audit of medical activity. Further details of the method are given elsewhere (Fraser and Patterson, 1974).

Results

In this study 1,865 investigations were requested for 1,298 patients. Table 1 shows the dimension of the project and the referral rates.

Laboratory and x-ray investigations were divided into two groups: those which were intended to establish or confirm a diagnosis and those which were performed with the assumption that the result would be normal for the purpose of excluding presymptomatic

TABLE 1

Doctors:	18
Total patient contact in survey:	33,953
Patients at risk (NHS list size of participating doctors):	42,290
NHS list size of partnerships not all participating:	73,763
Referral rate requests per 100 patient contacts:	3·8
Study referral rate calculated per 1000 patients at risk per year for comparison:	95
Area referral rate per 1000 patients per year:	45
TIME: 1.10.70—21.12.70	

pathology. X-ray examinations were considered to be one form of special examination. Thirteen per cent of patients for whom laboratory tests were requested had some investigation performed in the surgery first.

In the diagnostic group the reason for requesting a test was to establish a diagnosis in 56 per cent of the cases, as a management aid in 39 per cent, patient insistence 0·5 per cent and other reasons 3·4 per cent. Table 2 shows the number of tests in each group and the results obtained. There were 856 patients in the diagnostic group and 442 in the screening group. Of all the tests 24·8 per cent gave abnormal results.

TABLE 2

TESTS AND RESULTS

Test	*Diagnostic group*		*Screening group*		*Total (%)*
	Normal	*Abnormal*	*Normal*	*Abnormal*	
Haematology	332	144	257	18	*40·3*
Bacteriology	162	110	9	3	*18·2*
X-ray	146	93	12	1	*13·5*
Cervical cytology	42	5	186	12	*13·1*
Chemical pathology	120	63	20	6	*11·2*
Histology	2	2	6	1	*6·6*
Serology	14	12	84	1	*6·0*
ECG	1	0	1	0	*0·1*
Total number of tests	1248 (*34·1*)		617 (*6·4*)		1865
Number of patients	856		442		

Waiting times

The time taken for the reports to be available to the clinician are shown in table 3.

TABLE 3

WAITING TIME FOR RESULTS

N = 1298	*Per cent of reports received*					
Time in days	*0—3*	*4—7*	*8—14*	*15—21*	*22—28*	*28+*
Diagnostic	*44·6*	*79·2*	*89·5*	*94·4*	*97·3*	*2·7*
Screening including cervical cytology	*25·8*	*39·4*	*61·6*	*74·9*	*91·1*	*8·9*
Screening excluding cervical cytology	*38·0*	*57·7*	*90·6*	*96·4*	*98·6*	*1*

The results of four-fifths of the diagnostic tests and half the screening tests were available to the clinician within one week.

Diagnostic facilities and use of hospital

A hypothetical question was posed when a test was requested. "Had this service not been available would referral to hospital have been made?" The answers are recorded in table 4.

TABLE 4

DIAGNOSTIC FACILITIES AND USE OF HOSPITAL

Hospital referral	*Diagnostic* (%)	*Screening* (%)
Yes	*47·4*	*25·8*
No	*27·3*	*61·1*
Doubtful	*25·1*	*13·1*

Influence of the report on clinical management

An estimate of the influence which the investigation had on the management of a patient was made by recording the clinical diagnosis before and after the test result was known. Doctors noted their confidence in their assessments on a three-point scale. Table 5 indicates the effects of the test results on these diagnostic ratings.

TABLE 5

DOCTORS ESTIMATES OF THE ACCURACY OF THEIR DIAGNOSES

	Confident		*Fairly confident*		*Doubtful*	
	Before (%)	*After* (%)	*Before* (%)	*After* (%)	*Before* (%)	*After* (%)
Diagnostic group	*45*	*66*	*34*	*21*	*19*	*4*
Screening group	*94*	*96*	*3*	*2*	*3*	*0*

Influence of the investigation on clinical management

The actions taken as a result of the tests are shown in table 6.

TABLE 6

EFFECT OF INVESTIGATION

	Diagnostic group (%)	*Screening group* (%)
Continue present management	*68·1*	*93·8*
Start treatment	*7·3*	*2·3*
Change treatment	*8·2*	*1·9*
Refer to hospital	*7·6*	*1·2*
Further investigation	*4·3*	*0·4*
Stop present treatment	*4·0*	*0·2*
Total number of patients	874	470

Obtaining specimens and delivery to the laboratory

Table 7 shows who took the specimens.

TABLE 7

PATHOLOGICAL SPECIMENS

Person responsible for taking specimens	*Bacteriology*	*Serology*	*Chemical Pathology*	*Haematology*	*Histology*	*Cervical Cytology*
Doctor	69	49	73	364	6	242
Nurse	55	62	90	387	0	3
Patient	160	0	46	0	5	0

Specimens were delivered to the laboratory by a special pathology collection service in 36 per cent of cases, by the patient 29 per cent, by doctors ten per cent, by nurses three per cent and by post eight per cent.

Discussion

The group of general practitioners studied made twice as many demands on the laboratory services as the local average. The rate at which patients were investigated is expressed as a proportion of patient-contacts, which is capable of accurate measurement. Estimates of the number of investigations for a population at risk each year are more generally used. Our figures have been converted to these ratios for comparative purposes.

Despite the high investigation rate the proportion of abnormal tests is high—34 per cent in the diagnostic group—and there is evidence of investigation in the surgeries before laboratory involvement. This confirms Knox's (1973) statement that discretion is exercised by practitioners when they have open access. Anderson (1968) showed that general practitioners had a higher proportion of abnormal reports than other groups of doctors (contrast media only) and Cook (1966) showed that one quarter of x-ray requests by general practitioners showed significant abnormality. Thirty nine per cent of our x-rays showed abnormalities. Lodge (1973) points out that general practitioners investigate only those patients with whose problems they genuinely need help.

It is known that three quarters of all investigations are performed for one quarter of the general practitioners (Godber, 1959) and that the general practitioner's requests form one tenth of the local hospital laboratory workload (Trout, 1970). Undoubtedly if full use were made of the services these proportions would dramatically alter and planners should heed the evidence which shows that new entrants to general practice make a greater use of laboratory investigations (Hitchins and Lowe, 1966).

The reasons for using diagnostic tests have not been recorded before but the range of types of test required confirm Fry's (1964) view that they are relatively simple procedures.

Eight per cent of patients investigated were referred to hospital and this supports the contention that high investigators are also high referers. However, from this study we feel that considerably fewer patients were referred to hospital than would have been the case if diagnostic aids had not been available (table 4). The hospital outpatient referral rate is 2·5 per 100 consultations, compared with South Wales 3·5 (Williams, 1970) and South-west England 3·2 (Wright, 1968).

Doctors and nurses shared the task of obtaining specimens for investigation but in theory most could be collected by the nurse. This suggests that there is opportunity for more delegation. However, it will always be appropriate for doctors to obtain some specimens during the course of their examination.

Delivery of specimens to the laboratory is a task that can well be delegated. Patients play a significant part in this (inevitably when x-rays are involved). There is surprisingly little use of the secretary for this task. That one tenth of our specimens were delivered by doctors was unexpected but corresponds to those practices with close hospital connections. Even so, this cannot be an economical use of a doctor's time. The use of a pathological specimen collection service is the ideal solution. We recommend this for serious consideration in other areas.

Conclusion

The general practitioners in this survey made frequent use of the laboratory and radiological diagnostic services. Their involvement was an integral part of the management of their patients and shielded the hospital outpatient department from a significant burden.

Addendum

Since this survey ended investigations involving contrast media have been made available to general practitioners.

Acknowledgements

It is a pleasure to record that this study was supported by a grant from the Research Foundation Board of the Royal College of General Practitioners. We would like to thank Drs D. L. Crombie and R. J. F. H. Pinsent of the Royal College of General Practitioners Research Unit, Birmingham, for their helpful advice, Professor K. Haley, Department of Engineering Production, University of Birmingham, for access to computer services and Mrs Jones and staff of the College Research Unit, Birmingham for their help in supplying our recording questionnaires; also to Mrs J. Franklin for her secretarial help.

The participating doctors were: K. F. C. Brown, C. Cawte, G. Forrester, R. C. Fraser, T. R. Hailstone, M. L. L. Jones, L. Lewis, H. Marston, L. M. A. Munro, M. D. M. Parkes Bowen, H. R. Patterson, D. A. W. Sansome, R. G. D. Small, J. Smeeton, R. W. Taylor, A. H. Torrance, R. Wann, C. A. H. Watts.

References

Anderson, J. A. D. (1968). *Lancet*, **2**, 97–99.

Carstairs, V. & Skrimshire, A. (1968). *Health Bulletin*, **26**, No. 3. 12–22.

Cook, P. L. (1966). *British Medical Journal*, **2**, 351–354.

Fraser, R. C. & Patterson, H. R. (1974). *Journal of the Royal College of General Practitioners*, **24**. (In Press).

Fry, J., Dillane, J. B., Glendinning, A. C. & Keall, J. (1964). *Medical World*, **101**, 23–31.

Godber, G. E. (1959). *Lancet*, **2**, 224–229.

Hitchens, R. A. N. & Lowe, C. P. (1966). *Medical Care*, **4**, 142–149.

Irvine, D. & Jefferys, M. (1971). B.M.A. Planning Unit survey of general practice 1969. *British Medical Journal*, **4**, 535–543.

Knox, J. D. E. (1973). *Modern Medicine*, **18**, 6–7.

Lodge, T. (1973). *Modern Medicine*, **18**, 8–9.

Morrison, S. L. & Riley, M. (1963). *Medical Care*, **1**, 137–142.

Royal College of General Practitioners (1970). Present state and future needs of general practice. Second edit. *Report from General Practice*. No. 13. London: *Journal of the Royal College of General Practitioners*.

Scott, R. & Gilmore, M. (1966). The Edinburgh Hospitals. *In, Problems and Progress in Medical Care*. 2nd series. Nuffield Provincial Hospital Trust. P. 29. London: Oxford University Press.

Trout, K. (1970). Personal communication.

Williams, W. O. (1970). *Reports from General Practice* No. 12. London: *Journal of the Royal College of General Practitioners*.

Wright, H. (1968). *Reports from General Practice*. No. 8. London: *Journal of the Royal College of General Practitioners*.