

## Middle Articles

### GENERAL PRACTICE OBSERVED

#### X-ray Unit for General Practitioners

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General practice in this country has not always kept pace with the advances made in medical science during the past few decades. This is, however, not entirely the fault of the individual family doctor, since he has not always been provided with the necessary means to keep abreast of these advances in knowledge. One example is the provision of access for general practitioners to departments of diagnostic radiology. A recent survey (Medical Care Research Unit, 1963) has shown that whereas 79.1% of general practitioners have access to plain x-ray examinations, mainly of the chest, only 48.9% have access to x-ray examinations involving the use of contrast media. As a result of the lack of these diagnostic facilities, general practitioners have to refer to hospital consultants some patients whom otherwise they themselves could diagnose and treat. This is wasteful in time, man-power, and money, and tends to create the idea, even among general practitioners themselves, that they are simply referral agencies. In addition, the young doctor educated in an environment where the use of diagnostic x-ray facilities is increasing year by year is suddenly deprived of these facilities when he goes into general practice.

This paper describes a unit in Cardiff which provides a limited degree of direct access to x-ray facilities for general practitioners. The results of the first two years' work are reported, together with the clinical follow-up of the first year's work. An attempt is made to discuss the future needs of such units.

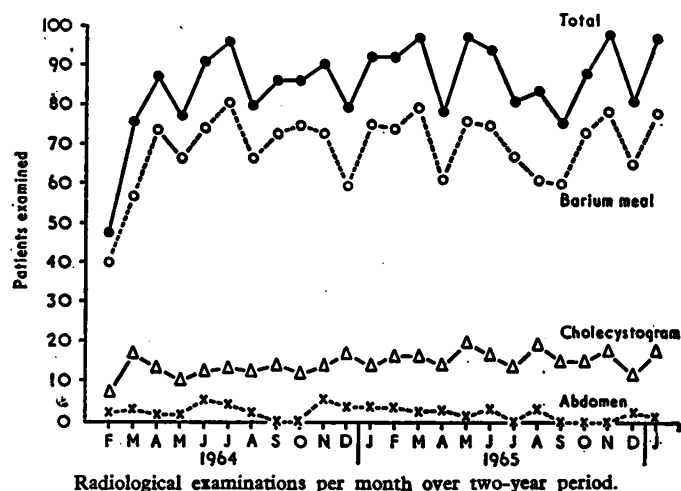
In February 1964 a G.P. x-ray unit was opened. It is staffed by the main hospital x-ray department, but in other respects is independent. The staff consists of a consultant radiologist, a senior radiographer, a secretary/receptionist, and a trainee radiographer. The unit offers facilities to a population of about 280,000. It was apparent from the outset that it could not satisfy the demands of all the general practitioners in the area for all types of examination. It was therefore decided to limit the examinations to barium meals, cholecystograms, and plain x-ray films of the abdomen. As a chest clinic exists in the city, this service was not duplicated. Three barium-meal sessions and two cholecystogram and plain abdomen sessions were offered weekly. All examinations were by appointment, and the results of the examinations were sent to the practitioner within 48 hours of their completion. The aim was to provide an efficient service for those patients who could be cared for by their own practitioners. This was to be achieved by having a short waiting-time and a rapid reporting-time, and it was hoped that the outpatient referral appointment time and main x-ray investigation time would be reduced.

#### Results

In the first year 1,075 requests for examinations were received. Sixty-three (6%) of the patients given appointments did not attend—a relatively low wastage rate. The total of 1,012 radiological examinations included 825 barium meals, 161 cholecystograms, and 26 plain x-ray films of the abdomen.

In the second year 1,095 requests for examinations were received. Forty-seven (4%) of the patients given appointments did not attend. The remaining 1,048 examinations included 838 barium meals, 193 cholecystograms, and 17 plain x-ray films of the abdomen. In the third and fourth years an increase in demand of 10% per year has been met.

There was a steady use of the facilities of the unit from the outset. No peaks of demand were apparent (see Chart). Our experience in this respect may be due to the fact that the opening of the unit in Cardiff was not advertised until a week before it started. For this reason doctors were not encouraged to build up a back-log of patients for x-ray examination in the weeks before the unit opened.



In the first year 50.9% of all examinations gave positive findings: 53.4% of barium-meal examinations, 37.9% of cholecystograms, and 53.9% of the straight x-ray films of the abdomen (Table I) showed significant abnormalities.

In the second year 49.7% of all examinations were positive, and included 53% of barium-meal examinations 33.2% of cholecystograms, and 82.3% of the straight x-ray films of the abdomen (Table I). These findings included all radiological abnormalities regardless of the reasons for which the investigation was requested.

The following findings are derived solely from a study of the first year's figures. One hundred and thirty-eight doctors were under contract to the Cardiff Executive Council—31 (23.5%) did not make use of the service and 107 were responsible for the 1,075 requests for x-ray examinations. Doctors practising in partnership were assumed to be responsible for an equal share of the total partnership list. There was a correlation between the frequency with which the unit was used and the

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TABLE I.—*Incidence of Positive Radiological Findings*

	Barium Meal		Cholecystogram		Plain Abdomen		Total		
	1964-5	1965-6	1964-5	1965-6	1964-5	1965-6	1964-5	1965-6	2 Years
Examinations performed .. ..	825	838	161	193	26	17	1,012	1,048	2,060
Positive x-ray findings .. ..	441 (53.4%)	444 (53%)	61 (37.9%)	64 (33.2%)	14 (53.9%)	14 (82.3%)	516 (50.88%)	522 (49.7%)	1,038 (50.3%)

list size and the number of years since an individual practitioner had been qualified. Apart from those doctors with very small lists, the frequency with which the unit was used declined as the numbers of patients on the doctor's list increased (Table II)—that is, the largest practices made the least use of the service. Similarly, the frequency with which the unit was used declined the greater the length of time since the individual doctor had been registered (Table III).

TABLE II.—*Relation Between Number of Patients on Practice List and Requests for Radiological Investigation*

Practice Size	No. of Doctors using Unit	Requests per 1,000 Practice Population
500-1,499	5	3.1
1,500-2,499	51	5.9
2,500-3,499	45	4.3
3,500+	6	1.8
Total	107	3.8

TABLE III.—*Relation Between Number of Years Since a Practitioner Qualified and Number of Requests Made for Radiological Investigation*

No. of Years since Qualification	No. of Doctors using Unit	Requests per 1,000 Practice Population
0-9	16	4.9
10-19	41	4.2
20-29	33	3.9
30-39	14	2.2
40-49	2	1.3
50+	1	6.2
Total	107	3.8

A form relating to every patient who had been x-rayed was sent to the general practitioner concerned, with a request to complete it in order that a relatively short-term follow-up could be made. A total of 803 (74.8%) of these forms were returned. Table IV summarizes the accuracy with which the general practitioner's diagnosis agreed with the radiological diagnosis at barium-meal examination. The diagnosis was regarded as correct only when the doctor specified the site of the lesion—for example, a duodenal or gastric ulcer, neoplasm, or hiatus hernia. Vague diagnoses were not considered. Similar figures for the cholecystographic examinations have not been prepared because correlation between radiological findings and surgical and necropsy findings do not appear to be sufficiently established. The percentage of correct diagnoses made by general practitioners in the case of barium-meal examinations was 31.8%, which is the same as the figure of Rawson (1965), who found 32% correct diagnoses made by the practitioner in such examinations.

Table V shows the subsequent clinical course of all the patients who were followed up. These figures reflect the general practitioner's clinical assessment as judged from his own records, and include all patients whether the radiological examinations showed positive findings or not. Many doctors

TABLE IV.—*Comparison of Accuracy of Clinical Examination by Practitioners With Radiological Diagnosis. (Barium-meal Examinations)*

Correct .. ..	191 (31.8%)
Incorrect .. ..	213 (35.4%)
No diagnosis made .. ..	174 (28.9%)
No radiological diagnosis .. ..	23 (3.9%)
	601 (100%)

TABLE V.—*Subsequent Clinical Course of Patients Investigated Radiologically*

Improved .. ..	440 (54.5%)
Lost trace of .. ..	137 (16.8%)
Referred .. ..	160 (19.6%)
I.S.Q. .. ..	59 (6.9%)
Incomplete return .. ..	17 (2.2%)
	813 (100%)

specifically reported that a considerable number of patients improved as soon as they were informed that the x-ray examination showed no abnormality.

While some may consider this to show a lack of the patient's confidence in the clinical acumen of his physician, it is nevertheless a common experience in modern medicine, and probably reflects the importance which the lay mind places on special investigations. Table VI shows the different specialists to whom the patients were referred for consultation, and in the case of patients referred to surgeons the number operated on.

TABLE VI.—*Fate of Patients Referred to Consultants After Attending the X-ray Unit*

Barium meal	To surgeon	Operated on	43 (47.3%)
		Not .. ..	13 (14.3%)
		To physician .. ..	28 (30.7%)
		To psychiatrist .. ..	7 (7.7%)
Cholecystogram	To surgeon	Operated on	33 (75%)
		Not .. ..	3 (6.8%)
		To physician .. ..	8 (18.2%)
Straight X-ray abdomen	To G.U. surgeon .. ..		6 (75%)
		To physician .. ..	2 (25%)
Referred for reasons not connected with x-ray examination ..			17
			160

Discussion

Access to x-ray departments is most commonly not available to general practitioners in areas of high population density in close vicinity to medical schools. Despite the fact that it has for long been Ministry of Health policy to encourage the provision of direct access to all diagnostic facilities, there still appears to be a reluctance in certain quarters to provide these facilities. This has been evident in the field of diagnostic radiology. It is often implied by those who give a low priority to such a service that the general practitioner will abuse the facilities and lead to overloading of the x-ray department. No abuse of direct access to an x-ray department was noted in Edinburgh, in Oxford, or in the survey for England and Wales conducted by the Medical Care Research Unit of the University of Manchester. Our experience in Cardiff confirms this.

The percentage of positive findings in this series is high and approximately the same as that obtained in a small sample of referrals from specialist sources in the main x-ray department of the Cardiff Royal Infirmary.

In Cardiff we found that, although over 1,000 additional radiological examinations have been performed each year, there has been no comparable reduction in the work of the main x-ray department, which normally undertakes a large proportion of the outpatient referrals for the whole of the city. This suggests that many of these patients would not have been x-rayed if the G.P. unit had not been in operation, and yet in 50% of them the radiological findings were positive, thus supporting the view that there is a hard core of unrecognized or, at any rate, uninvestigated disease in a community.

Hitchens and Lowe (1966) have conducted a retrospective study of the use of pathological services by general practitioners in Cardiff, and with few exceptions the findings concerning the use of the laboratory services by the general practitioners are the same as those concerning their use of an x-ray department. Hitchens and Lowe predict that the demand for the laboratory services by general practitioners will increase four-fold in the next 10 years. It is reasonable to assume that plans should be made for a similar increase in the use of radiological services, because the demand is likely to rise as more young doctors go into general practice, and because our experiences in this unit are based on a limited service.

For this reason the general practitioners who had used the unit were invited to state their preference for the more common

type of *x*-ray examinations. Particular emphasis was made with regard to the future care of the patient by the general practitioner at home. From the replies it is evident that barium-meal and gall-bladder examinations were by far the most popular and valuable investigations, barium enema and excretion urography following them in popularity, with *x*-ray examination of the bones and joints the least likely to be requested (see Table I—82% in 1965–6).

In deciding the direction of expansion, due consideration should be given to the saving of consultant outpatient time, and in this respect it may be that direct access for bone *x*-ray examination and intravenous pyelography should be made available first. Many cases of low back pain, for example, are referred to orthopaedic outpatient departments simply for an *x*-ray examination. It is the opinion of some orthopaedic surgeons (personal communication) that the general practitioner is perfectly capable of dealing with the majority of cases. Likewise, many patients who have had ureteric colic are referred to genito-urinary outpatient departments simply for a pyelogram, the practitioner having been able in most instances, and certainly in Cardiff, to have had the other necessary investigations—that is, urine examination, blood urea, serum calcium and proteins, midstream specimen of urine, etc.—carried out. There is no reason to suppose that the general practitioner will be less selective in radiological examinations other than those that have already been offered by the unit.

A follow-up of new patients coming to the *x*-ray unit shows that more than 50% improved clinically after treatment by their own general practitioners, and that less than 20% needed referral to a consultant. Of those who were referred to a surgeon after barium-meal and cholecystographic examination, nearly half of the former and three-quarters of the latter were treated surgically. This must represent a considerable saving in time, both to the patient and to the consultant, since in the majority of cases one consultation with the surgeon, instead of a subsequent consultation after *x*-ray examination, was needed before the patient was admitted for surgery. A further consequence of the saving of time must be a saving in money to the Health Service, since the cost of hospital care is relatively greater than that of domiciliary care. All the findings of this survey point to the fact that the ideal for a general-practitioner *x*-ray service

is probably one in which a wide range of *x*-ray facilities are offered.

In deciding how additional facilities should be made available, it is important to consider in its broadest sense the planning of medical care of the community. Simple expansion of the present unit might appear to be the economically logical method, but in a city such as Cardiff, with problems of transport and natural geographical barriers, the development of a number of strategically sited units has obvious advantages, both in case of access for the patient and in facilitating consultation between the general practitioner and radiologist, which we believe to be important. This type of service should be adapted to a particular locality, and it is suggested that in a city with the population of Cardiff (280,000) each general hospital should have a similar unit as part of its main *x*-ray department. Thus the essential general-practitioner *x*-ray service would become an integral part of an efficient diagnostic *x*-ray service to the community.

### Summary

The Cardiff General-Practitioner X-ray Unit provides a limited degree of access to *x*-ray facilities. During the first two years 2,060 examinations were performed; 1,663 barium meals, 354 cholecystograms, and 43 straight *x*-rays of abdomen. Significant abnormalities were revealed in 50.3% of all examinations.

A short-term clinical follow-up was made of 813 patients out of the 1,012 examinations performed in the first year. Of these patients 54.5% improved under the general practitioner's care alone; 19.6% were referred for consultant opinion and further investigation.

We wish to thank the general practitioners of Cardiff for answering questionnaires relating to their patients, and for their co-operation in helping us to complete the survey. To Miss Wendy Robinson-Evans, Mrs. E. Arino, and Mrs. R. Gretton we are indebted for invaluable secretarial help.

### REFERENCES

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## NEW APPLIANCES

### Proctology Table

Mr. J. ALEXANDER WILLIAMS, consultant surgeon, Nutritional and Gastroenterological Unit, the General Hospital, Birmingham 4, writes: The anus and distal bowel is examined in different ways by different surgeons. Some prefer the patient in the left lateral position, some in the head-down supine (knee-elbow) position, and some in the lithotomy position. The left lateral is probably the least disturbing and embarrassing for the patient, but the head-down supine has particular advantages. If the patient has fluid faeces or bleeds during the course of examination or manipulation then in the head-down supine position the fluid or blood tends to run away from the instrument instead of back to the open end or eyepiece. The demonstration of technique and proctoscopic findings to students is simpler with the patient in the head-down than in the lateral position. Also, in a clinic in which a large number of patients with colitis are seen, or in which many with haemorrhoids are treated by injection or rubber-band ligation, the comfort of the surgeon is greater if he is examining the patient at eye level.



Sigmoidoscopy in patient with colitis.

For the patient the knee-elbow position is uncomfortable and undignified. Yet to improve their patient's comfort few can justify the expense of the complicated tables that rise, fall, and bend at the touch of a switch.

A simple, inexpensive, robust table has been developed (see Fig.). It has a Sorbo-covered kneeling platform with two thigh-retaining safety straps. The rise and fall of this is controlled by a lever-operated hydraulic jack. This enables the patient to kneel at a comfortable level and then be raised gently until he can comfortably bend and lie with his abdomen flat on the main table. The table is then tilted by a worm-screw controlled by handles at either side.

At the kneeling end castors permit the table to be moved easily if required, while at the other end rubber feet give stability.

The table has been in use in our rectal clinic for one year and has proved convenient for the examiner and acceptable to the patients.

The table is produced by the Cape Engineering Company, Warwick.