

Influence of Royal College of Radiologists' guidelines on referral from general practice

Royal College of Radiologists Working Party

Abstract

Objective—To measure the effect on general practitioner referrals for radiography of introducing guidelines of good practice together with monitoring and peer review.

Design—Collection of referral data during 1 January 1989 to 31 December 1990. Guidelines were introduced on 1 January 1990.

Setting—Open access radiology services provided by one non-teaching district in England.

Subjects—144 614 registered patients from 22 practices.

Main outcome measures—Number of referrals per 1000 registered patients for radiography of the chest, skull, spine, abdomen, limbs, and joints and for barium investigation and excretion urography.

Results—Overall referrals fell from 88.4/1000 registered patients to 77.2/1000 after the guidelines were introduced. The commonest reasons for referral were for examination of the chest, spine, and limbs and joints and referrals for these fell by 9.4%, 17.5%, and 13.5% respectively. Referrals for skull radiography fell by 30% (from 241 to 168).

Conclusions—By helping general practitioners to be more selective in their use of diagnostic radiology, the guidelines reduced the rate of referral and thus patients' exposure to radiation.

Introduction

In 1981 a joint working party of the Royal College of General Practitioners and the Royal College of Radiologists recommended that direct access to radiological services is essential to family doctors; it shortens the investigation time and improves the quality of service offered by general practitioners.¹ These recommendations are supported by the results of several studies showing that practitioners generally use unrestricted access to diagnostic radiology responsibly and with discrimination.²⁻⁸ A study by Stoddart and Holl, however, suggested that if practitioners adopted patient selection guidelines governing the appropriate choice of radiological examination the level of referral could be reduced by around 30%.⁹ Keogan *et al* studied 2017 patients referred for chest radiography and recommended more selective use of chest radiography through the application of selection guidelines.¹⁰ An experimental study from Plymouth reported a 23% reduction in general practitioner referrals after local guidelines were distributed.¹¹

This paper describes an audit of general practitioner referrals for radiography in one health district in England before and after the introduction of the Royal College of Radiologists' booklet *Making the Best Use of a Department of Radiology*.¹² An audit of the effect of these guidelines on hospital referral practice has been described.^{13,14}

Methods

The study, which had the full support of the local medical committee and the district medical advisory committee, was carried out between 1 January 1989 and 31 December 1990 in a non-teaching district in England. The district was mainly rural with several small seaside and market towns. A consultant radiologist was nominated as the local research coordinator and was responsible for the day to day running of the study and the preliminary public relations work. Local general practitioners and the hospital medical staff of the district had agreed to the establishment of a radiology referral review committee for the period of the study. The committee was set up to endorse the introduction of the college's guidelines as district policy and to oversee the collection, analysis, and monitoring of referral data from the district's radiology departments. General practitioners and the main specialties were represented on the committee, which was chaired by the local coordinator.

A computerised data collection system had to be set up to monitor each general practitioner's referrals per 1000 patients on the practice list. Baseline general practitioner referral practice was monitored during 1 January to 31 December 1989 and the guidelines were officially introduced on 1 January 1990. The guidelines' acceptability and their effect on referral practice was observed during 1 January to 31 December 1990. Before the guidelines were formally introduced the local coordinator apprised the local medical committee of their content and the nature and purpose of the study. The coordinator or a member of the radiology referral review committee also visited all the larger general practices to explain the purpose of the study, to show the participating practitioners the guideline booklet, and to obtain their approval. The committee monitored referral practice during the study but there was no reinforcement of the guidelines to assure compliance.

The family practitioner committee was unwilling to disclose the size of individual practices and so, to preserve anonymity, practices were grouped into nine geographical zones and their referrals represented as rates per zone. Thirty practices with a combined list of 175 417 patients had open access to the radiology services provided by the district. Many patients from eight practices in two of the zones were referred for examination to an adjacent district because radiology facilities were nearer. These practices have been excluded from the analysis, which is therefore based on referrals from 22 practices with a combined list of 144 614 registered patients.

Results

Referrals from general practice made up 40% of the workload of the district's radiology service. In all 79% (23 949 of 30 253) of general practitioner referrals were

Members of the working party are listed at the end of the paper.

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for one of the seven examinations covered in the guideline booklet (chest, skull, spine, abdomen, barium investigation, excretion urography, and limbs and joints). The highest referrals were for examination of the chest (8506, 28%), limbs and joints (7666, 25%), and spine (5224, 17%).

Before the guidelines were introduced the referral rate from general practitioners for examinations covered by the guidelines was 88.4/1000 registered patients (table I). This fell to 77.2/1000 after introduction of the guidelines. The referral rate fell in six of the seven zones. The number of zones with a referral rate below 75/1000 registered patients rose from one (representing two practices) to four zones (17 practices) after the guidelines were introduced. Zone D, the only zone with an increased level of referral after the guidelines, also had the highest level of referral before the guidelines.

Table II compares the actual number of referrals before and after introducing the guidelines by type of examination requested and shows the absolute change in terms of workload and cost. This comparison is possible because the list size remained largely unchanged over the two year study. The largest reductions were observed in referral for examinations of the skull (30.3%), spine (17.5%), limbs and joints (13.5%), and chest (9.4%). Although together they made up only 8% of referrals in the year before the guidelines the reduction in barium investigation and excretion urography contributed 25% of the savings achieved in the second year.

Discussion

The reduction in referrals we observed and the 23% reduction reported in Plymouth Health District¹¹ followed voluntary adoption of the guidelines by practitioners without any reinforcement of guidelines to ensure compliance. Studies of hospital practice suggest that larger reductions could be achieved and sustained if the guidelines became a required standard of good general practice and formal peer review was introduced with steps to ensure compliance, particularly among practices with high referral rates.¹⁴

The variation in referral rates among general practice was much less than that reported in hospitals.^{13,14}

The narrow range of referral rates after the guidelines for six of the seven zones (69.2-81.9/1000 registered patients) suggests an appropriate target referral rate of below 75/1000 registered patients a year. Practices with referral levels above 100/1000 registered patients should urgently review their referral practice. We found two practices (in zone D) with referral rates above 100/1000. Both practices were sited in the grounds of a hospital with a radiology department so each had open and immediate access to radiographic examination.

After the guidelines were introduced there were 1582 fewer referrals for radiography and 223 additional referrals for ultrasonography from a registered population of 144 614 patients, resulting in a potential saving of about £13 000 excluding ambulance costs. This figure may be even lower in future following the publication, early next year, of a revised edition of the guidelines which will include a new section on diagnostic ultrasonography. No concurrent increase in referrals from other sources was observed. Radiological referrals from all sources in the district decreased in 1990: general practice by 9.4%, hospital inpatients by 15.4%, hospital outpatients by 14.6%, and accident and emergency units by 11.1%.

Generation of referral data should be a routine requirement for all NHS radiology departments. Without this information the appropriateness of the referral practice of individual users or the whole organisation cannot be monitored. This requirement should be specified in the tender document for the purchase of radiology services.

Since their publication in April 1990 about 30 000 copies of the college guidelines have been distributed to hospital doctors throughout the NHS. Our study shows that the guidelines are acceptable to and suitable for use by general practitioners and suggests that they can substantially reduce referral levels and reduce patients' exposure to radiation. Application of these results throughout the whole of the United Kingdom would reduce referrals by at least 0.6 million and produce potential savings of £5.4 million.

Members of the Royal College of Radiologists working party were P Bourdillon, E R Davies, W P Ennis, K T Evans, P M Hacking, J W Laws, M R McNulty, C J Roberts, G M Roberts, and R Sutherland; members of the local review committee were D Andrew, D Cain, P R Camm, C Campion-Smith, P Hull, P J Jeffery, A J Johnson, P G Johnston, and R Williams. We thank all those connected with the study and the Department of Health and King's Fund for financial support.

TABLE I—Effect of radiology guidelines on general practitioner referrals per 1000 registered patients

Zone	No of practices	List size*	Before guidelines		After guidelines		% Reduction in referrals
			No of examinations requested	Referral rate/1000	No of examinations requested	Referral rate/1000	
A	3	26 429	2393	90.5	1880	71.1	21.4
B	2	20 910	1492	71.4	1446	69.2	3.1
C	7	25 349	2175	85.8	1889	74.5	13.1
D	2	5 303	739	139.4	792	149.3†	
E	1	11 556	1174	101.6	946	81.9	19.4
F	2	25 219	2437	96.6	2060	81.7	15.5
G	5	29 848	2372	79.5	2154	72.2	9.2
Total	22	144 614	12 782	88.4	11 167	77.2	12.6

*Effectively constant over the study period. †7% Increase in referrals.

TABLE II—Effect of radiology guidelines on general practitioners' referrals by type and cost of examination

Examination	No of referrals before guidelines	No of referrals after guidelines	% Reduction	Cost of examination (£)*	Savings after introducing guidelines (£)
Chest	4463	4043	9.4	5.6	2352
Skull	241	168	30.3	9.9	723
Spine	2863	2361	17.5	7.9	3966
Abdomen	51	68	-33.3†	6.1	-104†
Barium investigation	613	570	7.0	39.3	1690
Excretion urography	441	401	9.1	41.4	1656
Limbs and joints	4110	3556	13.5	6.1	3379
Total	12 782	11 167	12.6		13 662

*Costs for year 1990-91. Supplied by the unit accounts department of the Huddersfield Royal Infirmary.

†Increase.

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