

# Diagnostic ultrasound: a primary care-led service?

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## SUMMARY

**Background.** A training programme has been proposed for general practitioners (GPs) to perform ultrasound in primary care. This has generated considerable concern among radiologists as to the adequacy and appropriateness of such training.

**Aim.** To assess the current provision of ultrasound services to primary care in the former Northern health region of England, the level of interest among GPs in undertaking recommended training, and the willingness or ability of radiology departments to provide it.

**Method.** Postal questionnaires were sent to GPs ( $n = 334$ ), their practice managers ( $n = 281$ ) and all clinical directors/heads of radiology departments ( $n = 19$ ) in the region.

**Results.** Altogether, 67% of GPs, 59% of practice managers, and 68% of radiologists returned questionnaires. Overall, 48% of GPs have open access to obstetric/gynaecological ultrasound compared with 77% for general diagnostic requests. A total of 73% of GPs would prefer an open access service and 15% a practice-based service. Some 48% of GPs were not interested, 36% moderately interested, and 16% very interested in participating in the training programme. Only two out of 13 radiology departments were willing to provide such training.

**Conclusion.** Despite recommendations from the Royal College of General Practitioners, around half the respondents in this survey do not have direct access to ultrasound for obstetric referrals, and a quarter for non-obstetric referrals. Interest shown by GPs in a primary care-led service is not mirrored by their radiology colleagues. Open access to ultrasound was considered the optimum service, suggesting that resources be targeted at improving hospital services rather than transferring facilities to primary care.

**Keywords:** ultrasound; general practitioner services; primary-secondary care interface.

## Introduction

THE National Health Service is becoming increasingly primary care led, resulting in general practitioners (GPs) and primary care teams having greater and more diverse clinical and managerial responsibilities.<sup>1,2</sup> The range of practice-based services and investigative procedures has expanded,<sup>3,4</sup> but the extent to which the latter are performed by GPs remains limited.<sup>5</sup> It is accepted that GPs should be provided with direct access to most diagnostic imaging services, provided that referrals adhere to

approved guidelines.<sup>6</sup> However, there are increasing demands for imaging services to be community based. The use of radiographic equipment is subject to strict regulations because of the hazards of ionizing radiation,<sup>7</sup> although there are no restrictions on the purchase or use of ultrasound equipment.

The Royal Colleges of General Practitioners and Radiologists have recently proposed a training programme to allow GPs to perform basic ultrasound examinations in primary care.<sup>8</sup> The recommended training includes a lecture course and one year's practical experience on a one-session-per-week basis. These proposals have generated concerns among radiologists as to the adequacy and appropriateness of such training.

The aims of this study were to evaluate the current provision of ultrasound services to primary care in the former Northern Region, to estimate the potential workload of suitable cases for practice-based ultrasound, to assess the level of interest among GPs in undertaking ultrasound training and, finally, to determine the ability and willingness of local radiology departments to participate in a training programme.

## Method

A postal questionnaire was circulated in June 1995 to a one-in-five sample of GPs ( $n = 334$ ) selected from family health services authority lists in the former Northern Regional Health Authority. The questionnaire was initially piloted to a random sample of GPs in Newcastle upon Tyne ( $n = 40$ ) and subsequently modified. The questionnaire contained a mixture of open and closed questions and enquired about the respondents':

- Previous experience of higher obstetric and radiological training
- Current access to diagnostic ultrasound, including referral rates and waiting times
- Preferred route of access to ultrasound
- Interest in undertaking the basic ultrasound training programme.

Separate data were sought for obstetric and non-obstetric referrals. Non-respondents were sent a further copy of the questionnaire in September 1995.

A second questionnaire was circulated to the practice managers of the study sample ( $n = 281$ ) to corroborate data on referral rates and waiting times, and to enquire about the potential caseload for practice-based ultrasound through an assessment of antenatal referrals and first trimester miscarriages.

A third questionnaire was sent to the clinical directors/heads of radiology departments in the former Northern Regional Health Authority ( $n = 19$ ). This questionnaire enquired about:

- The access to diagnostic ultrasound for primary care currently provided by their departments
- The proportion of their workload generated by primary care
- Their present training commitments for ultrasound and any local interest expressed by GPs in acquiring appropriate training for primary care.

## Results

The response rate for GPs was 67.4% (225/334) and 59.1% for practice managers (166/281).

Of the 225 practitioners responding, 202 (89.8%) were in full-

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time practice, 22 (9.8%) were in part-time employment and one (0.4%) was part of a job share. A total of 58 (20.6%) were fundholding practices. GPs' responses are summarized in Table 1.

#### *Current and preferred access to diagnostic ultrasound facilities*

It can be seen that only 48% of general practitioners have open access to obstetric/gynaecological ultrasound compared with 77.3% for general diagnostic requests. Eight GPs described restricted access for obstetric/gynaecological problems and 10 reported access for assessment of problems in early pregnancy via specific clinics. Similarly, for non-obstetric/gynaecological cases, 13 GPs described access limited to specific problems, such as suspected biliary disease. A further six were able to negotiate ultrasound examinations for individual patients through direct discussion with the radiology department.

Regarding the future provision of ultrasound, 72.9% requested an open-access service, with 14.7% interested in a practice-based service manned either by a trained GP or a visiting ultrasonographer. A further 8.9% favoured a flexible combination of the proposed options, including open access, tailored to the clinical problem.

#### *Training in diagnostic ultrasound in primary care*

Regarding the training of GPs to perform ultrasound in primary care, 108 respondents (48.0%) classified themselves as not interested, 80 (35.6%) as moderately interested and 35 (15.6%) as very interested. Two responses remained unanswered.

Table 1 demonstrates current and preferred access to ultra-

sound, and previous relevant experience according to GPs' level of interest in ultrasound training. Access to both obstetric and non-obstetric ultrasound is similar in all groups, and open access is considered the most appropriate method of provision of ultrasound. Of the 15% of GPs who would prefer a practice-based ultrasound service, with scans performed either by a trained GP or an ultrasonographer, 76% expressed interest in the proposed training compared with 47% of those GPs who preferred other options for access to ultrasound.

Twenty five (11%) respondents admitted to a degree of practical experience in diagnostic ultrasound; these GPs with prior practical experience were more likely to be interested in ultrasound training. The majority (17) had gained ultrasound experience during training in obstetrics and gynaecology, and it included assessment of fetal viability, presentation and gestational age. Four had more extensive experience as clinical assistants or higher trainees in obstetrics, with a further three describing practical experience in general abdominal and 'small parts' ultrasound and echocardiography.

Overall, 49 GPs (21.8%) had experience of obstetrics in addition to that gained during vocational training; of these, 41 (83.7%) were at senior house officer level, five (10.2%) at registrar level and two (4.1%) at senior registrar level. Only one (0.4%) had experience of higher radiology training and this was to senior registrar grade.

Concerns raised about the training included lack of time (14 respondents) and sources of funding for training, equipment and locum cover (four respondents). Two commented that the good ultrasound service available at their local provider unit made alternative provision unnecessary.

**Table 1.** Results of the questionnaire to general practitioners in the former Northern region (n = 225).

	Total number of respondents n = 225 (%)	Level of interest in training		
		Not interested n = 108 (%)	Moderately interested n = 80 (%)	Very interested n = 35 (%)
<b>Current access to obstetric ultrasound</b>				
Open	108 (48.0)	51 (47.2)	40 (50.0)	17 (48.6)
Indirect	76 (33.8)	36 (33.3)	27 (33.8)	12 (34.3)
Other	20 (8.9)	8 (7.4)	4 (5.0)	1 (2.9)
Combination	13 (5.8)	9 (8.3)	7 (8.8)	4 (11.4)
Unanswered	8 (0.5)	4 (3.7)	2 (2.5)	1 (2.9)
<b>Current access to non-obstetric ultrasound</b>				
Open	174 (77.3)	86 (79.6)	62 (77.5)	26 (74.3)
Indirect	22 (9.8)	5 (4.6)	10 (12.5)	6 (17.1)
Other	12 (5.4)	7 (6.5)	4 (5.0)	1 (2.9)
Combination	9 (4.0)	6 (5.6)	2 (2.5)	1 (2.9)
Unanswered	8 (0.5)	4 (3.7)	2 (2.5)	1 (2.9)
<b>Preferred future method of providing diagnostic ultrasound</b>				
Open access	164 (72.9)	87 (80.6)	55 (68.8)	19 (54.3)
Practice-based facilities with a visiting ultrasonographer	17 (7.6)	6 (5.6)	6 (7.5)	5 (14.3)
Practice-based facilities with a trained general practitioner	16 (7.1)	2 (1.9)	6 (7.5)	8 (22.9)
Indirect access	4 (1.8)	3 (2.8)	1 (1.3)	0
Mobile unit manned by ultrasonographer	2 (0.9)	0	2 (2.5)	0
Combination of options	20 (8.9)	10 (9.3)	9 (11.3)	3 (8.6)
Unanswered	2 (0.9)	0	1 (1.3)	0
<b>Previous ultrasound experience</b>				
Higher obstetric training	25 (11.0)	5 (4.6)	13 (16.3)	7 (20.0)
Higher radiology training	49 (21.8)	26 (24.0)	18 (22.5)	5 (14.3)
Unanswered	1 (0.4)	0	0	1 (2.9)

### Referral rates

Information from both GPs and practice managers indicated a wide variation in referral rates per GP per year: the mean obstetric/gynaecological ultrasound referral rate was 9.1 (range 1–120), abdominal ultrasound mean 10.3 (range 1–100) and other categories mean 1.7 (range 1–50). Also, estimates of potential workload for performing ultrasound in primary care varied widely with a mean for antenatal referrals of 76 per practice per year (range 2–284) and a mean miscarriage rate of 7 per practice per year (range 1–42).

### Waiting times

A total of 71% of GPs reported that routine ultrasound requests received an appointment within 28 days and 70% said that urgent requests were processed within four days. Routine reports were received within 14 days by 95% of respondents and urgent reports within five days by 90%.

### Response from heads of radiology departments

Completed questionnaires were received from 13 radiology departments (68%) and the findings are recorded in Table 2. The departments varied in size and ultrasound workload. The majority of departments (11/13) provided GPs with open access to ultrasound, while two departments restricted access to certain clinical conditions. Twelve departments already provided training for a variety of professionals. Only three of 13 departments responding would be able to accommodate a GP for practical training in ultrasound, and only two were willing to offer such training. Only two departments had been asked to provide practical training.

A number of concerns were raised regarding the proposed training, principally centred around funding and the accuracy of reporting. Other options (for example, improving the existing service and developing outreach clinics) were suggested in preference to the proposed training of GPs.

### Discussion

Despite recommendations from both the Royal Colleges of Radiologists and General Practitioners,<sup>6,9</sup> over half of the respondents in this survey do not have direct access to ultrasound for obstetric problems, and around a quarter lack open access for non-obstetric referrals. The division between access for obstetric and non-obstetric problems reflects the fact that management of the former in this area is largely the responsibility of obstetric/gynaecology departments rather than radiology departments. Requests for problems of pregnancy are likely to require rapid management decisions and may therefore be more appropriately arranged in conjunction with hospital specialist referral.

Several studies have confirmed the benefits of open access radiology, including help with diagnosis and management and reduced referral rates to outpatient clinics.<sup>10,11</sup> In addition, open access to barium studies, ultrasound and IVU examinations have been shown to be the facilities most likely to avoid outpatient referral.<sup>10</sup> Open access was considered by nearly three quarters of respondents to be the optimum provision for diagnostic ultrasound. All of the radiology departments responding provide GPs with direct access to ultrasound, although in two cases this was restricted to specific clinical indications. The apparent mismatch in the service provided and that perceived by the GPs suggests a need for improved communication regarding the effective use of ultrasound.

The traditional model of providing specialist outpatient services in secondary care is being questioned. Outreach clinics, in

which the hospital team provides a diagnostic/management service in primary care, offer ease of access and shorter waiting times to patients, but may be subject to practical difficulties, such as inferior facilities and poor scanning quality.<sup>3,12</sup> A limitation of this study is that inferences about a greater need for practice-based ultrasound in isolated areas cannot be drawn, as urban/rural categorization was not included in the questionnaires.

Although this option for providing ultrasound was not popular with respondents in this survey, the ability of fundholding practices to purchase equipment and implement a practice-based service may lead to the development of a two-tier system with poor-quality scans performed in primary care, rather than an improvement in the present hospital service. Twenty per cent of responding practices were fundholding at the time of this survey; the estimated proportion of fundholding practices in the Northern region in 1995 is 31–33% compared with a national level of 40%, and as fundholding increases more practices may consider the purchase of diagnostic equipment.

Although successful community-based ultrasound with scanning performed by GPs has been reported,<sup>13</sup> such schemes had not been described in the United Kingdom until a recent study reported the value of general practice ultrasound in assessing fetal viability.<sup>14</sup> In the present survey, half of the GP respondents expressed an interest in undertaking ultrasound training. However, it would be reasonable to assume that only the 16% who expressed the greatest interest would pursue training, and the remaining 84% would not. This study indicates a wide variation in ultrasound referrals between individual GPs and practices, and also in the potential caseload for practice-based ultrasound,

**Table 2.** Results of the questionnaire to clinical directors/heads of radiology departments (n = 19).

Number of consultants in department	1–9 (mean = 5)
US performed by	Number of departments
Consultants	12
Trainee radiologists	8
Radiographers	13
Other staff	3 *
US training given to	Number of departments
Trainee radiologists	10
Radiographers	8
Other	2 †
US examinations per year	4700–22 600 (mean = 10 500)
US referrals from primary care	400–4000 (mean = 1950)
GP referrals as % of workload	5–40%
Access provided to GPs	
Open	11
Limited	2 †
Waiting times for GP referrals (days)	
Routine requests	10–60
Urgent requests	1–14
Able to accommodate GP	
Yes	3
No	10
Willing to provide training	
Yes	3
No	10

US = ultrasound. \*Obstetricians, medical physicists. †Midwives, obstetricians. ‡Open access for specific diagnostic problems, other cases possible following discussion.

as judged by antenatal referrals and miscarriage rates; therefore, GPs performing ultrasound in primary care may do so infrequently and thus have difficulty maintaining expertise.

In our survey, the majority of departments (11/13) could not provide training for GPs, either because they were unwilling or unable to do so. The issue of ultrasound training for non-radiologists, such as GPs, has provoked considerable debate.<sup>15</sup> A number of factors concern radiologists both locally and nationally; principally, the adequacy of the training, existing demands for training, and sources of funding for both training and equipment. Primary care referrals constitute up to 40% of the annual ultrasound workload for radiology departments in this region, and there would obviously be economic considerations if a proportion of this service was performed by GPs themselves.

Only 15% of GPs in this study regarded a primary care-based ultrasound service as their future service of choice, run either by a trained GP or by a visiting radiographer. By comparison, a recent national survey revealed that 31% of GPs were interested in providing ultrasound in primary care, but concluded that the interest arose from a desire for a more efficient and effective service rather than a need to perform ultrasound themselves.<sup>17</sup>

In our survey, almost three quarters of patients were seen within five days for urgent referrals, and within 28 days for non-urgent referrals. Reporting times were usually within five days and 14 days for urgent and non-urgent referrals respectively. These efficiency figures compare well with other studies that have demonstrated waiting times of between two and six weeks,<sup>16</sup> and reporting times of up to 10 days.<sup>17</sup>

This study has revealed variations in the provision of diagnostic ultrasound to GPs in the Northern region. Despite recommendations that GPs should have direct access to this service, radiology departments do not appear to meet regional needs. The ability of fundholding practices to purchase and deliver their own diagnostic services may be viewed as a solution to deficiencies in the service provided by secondary care. However, the level of interest shown by GPs in this study, in undertaking training in ultrasound, is not mirrored by the attitudes of their radiology colleagues, who are unable or unwilling to support such a transition. Moreover, the proportion of GPs in this region likely to embark upon training if it were available is small, with improved open access being the preferred choice for most GPs. These findings suggest that attention and funding should be directed towards the development and maintenance of a high-quality, efficient and approachable hospital-based ultrasound service rather than an inappropriate service in primary care.

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