Do gastroenterologists want to be trained in ultrasound? A national survey of trainees in gastroenterology

C P Jamieson, E R E Denton, W R Burnham

Abstract

Aims—(1) To establish whether gastroenterologists wish to train in abdominal ultrasound according to the Royal College of Radiologists' document, *Guidance for the training in ultrasound of medical non-radiologists*. (2) To determine whether the ultrasound workload generated by gastroenterologists differs from that by other clinicians.

Methods—A postal questionnaire was sent to all 278 gastroenterology trainees. The indications and findings of 100 consecutive gastroenterologist requested scans were compared with 100 scans requested sequentially by other clinicians through a teaching hospital radiology department.

Results—82% of the survey forms were returned. 77% of trainees wished to train in abdominal ultrasound and 68% were prepared to train in the manner outlined in the guideline document. However, 86% felt that they would ideally prefer not to assess renal or pelvic pathology, restricting to hepatobiliary diagnosis only. 73% of trainees did not anticipate that a further scan by a radiologist would be required. Comparison of gastroenterology scans with those requested by other clinicians revealed a relative excess of hepatobiliary indications and findings, and a notable paucity of renal and pelvic pathology in gastroenterology practice.

Conclusions—There is general interest in abdominal ultrasound training among gastroenterology trainees and broad acceptance of the guideline document. However, most trainees perceive a focus of training restricted to hepatobiliary disease to be most appropriate. The case mix study provides support for this viewpoint. It is suggested that a more focused ultrasound training for gastroenterologists be considered.

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Formal abdominal ultrasound training is considered to be a necessary part of the European Diploma in Gastroenterology.¹ Ultrasound training criteria for obstetricians and general practitioners in the UK already exist.² Many radiology departments currently have a significant waiting list for abdominal ultrasound examinations and this situation is unlikely to change imminently as there is a predicted

shortfall of trained radiologists.³ There is increasing interest in the "patient focused"⁴ and "one stop"⁵ approaches to outpatient management which would both potentially include the availability of ultrasound in the clinic. The Royal College of Radiologists has published a document, *Guidance for the training in ultrasound of medical non-radiologists*,¹ which details their requirements for theoretical and practical training in ultrasound (see box).

The Joint Committee on Higher Medical Training (JCHMT) Gastroenterology Curriculum⁶ includes imaging as one of the optional modules (ultrasound, computerised tomography, magnetic resonance imaging, nuclear medicine, and endoscopic ultrasound). Details of a syllabus or requirements for training in modalities other than ultrasound have not yet been given. The current Royal College of Radiologists' estimate of costs for training a medical specialist registrar in ultrasound alone is £3000-3500.³

The aim of this survey was to determine the current aspirations of UK gastroenterology trainees regarding ultrasound experience. The ultrasound workload generated by a teaching hospital gastroenterology department was compared with that of other adult medical specialities to assess the specific areas of need for ultrasound skills in gastroenterology.

Methods

A survey form (summarised in table 1 with the trainees' answers included) was prepared. This was circulated to all 278 UK gastroenterology specialist registrars holding national training numbers in July 1997 together with the keypoints summary of the document, *Guidance for the training in ultrasound of medical non-radiologists* (see box).¹ The aim was to establish the proportion of specialist registrars wishing to receive ultrasound training, the specific areas of training they identified as useful to their practice, and the commitment to maintaining competence they expected to be able to make. Completed forms were returned anonymously using supplied stamped addressed envelopes.

In order to determine the area of need for ultrasound skills in gastroenterology, 100 abdominal ultrasound examinations sequentially requested by the gastroenterology department at Guy's Hospital were compared retrospectively with 100 abdominal ultrasound examinations sequentially requested by other

Abbreviations used in this paper: JCHMT, Joint Committee on Higher Medical Training.

Department of
Gastroenterology,
Royal London
Hospital, Whitechapel,
London, UK
C P Jamieson

Department of
Radiology, Guy's
Hospital, London, UK
E R E Denton

Department of
Gastroenterology,
Oldchurch Hospital,
Romford, UK
W R Burnham

Correspondence to:
Dr C P Jamieson,
Department of Human
Nutrition, Royal London
Hospital, London E1 1BB,
UK.

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Keypoint summary

Guidance for the training in ultrasound of medical non-radiologists

A non-radiologist should achieve the standard of training reached by a trainee radiologist at the time of attaining the Fellowship Examination of the Royal College of Radiologists.

Training should consist of a theoretical module based on the first FRCR examination syllabus and then one or more practical modules of training as appropriate to meet the clinical needs of the practitioner.

The practical modules suggested are:

- 1 Abdominal ultrasound—hepatobiliary, pancreatic, and intestinal imaging with elements of urological and gynaecological ultrasound included
- 2 Gynaecological ultrasound
- 3 Urological ultrasound

The theoretical module would include the physics of ultrasound, levels and sophistication of equipment, image recording, reporting, and the relevance of other imaging modalities to ultrasound.

Each practical module has a syllabus incorporating theoretical training on anatomy and pathology and practical training under the guidance of a named radiologist in a training department (accredited by the RCR). During training, the trainee should personally perform 300 examinations for the first practical module, with an additional 150 for each further module. Training should be acquired in at least one session weekly during which 5–10 patients should be examined, and should be spread over no less than 3 months. Practical training would usually take about 6 months.

All trainees must be registered with the RCR for each separate module in order to monitor demand and assist with manpower planning. A nominal registration fee will be charged.

To maintain sufficient experience in ultrasound, the RCR recommends that the trained medical non-radiologist should undertake a minimum of 300 examinations per annum. There should be a requirement for 10 specific ultrasound CME credits annually, half of which could be Category II (internal) credits acquired during periods of supervised scanning undertaken in an accredited teaching department, preferably the trainee's parent teaching department.

medical, surgical, and orthopaedic departments at Guy's Hospital and local general practitioners. Obstetric, gynaecology, and paediatric examinations were excluded from the analysis. The indications written on each request form were recorded, together with the findings reported by the radiologist for each examination. Comments relating to a difficult ultrasound examination and/or a need for further investigations made by the radiologist were also noted. All data were analysed using Microsoft Excel 7.0.

Results

In total, 228/278 survey forms were returned by trainees, a response rate of 82%. Seventy seven per cent of responders wanted to receive some training in abdominal ultrasound and 68% would be prepared to receive training as described in the guideline document. Most of those (80%) prepared to train in this manner, would still wish to do so even if such training were only required for European accreditation.

There were a number of specific benefits to clinical practice anticipated by specialist registrars from training in ultrasound. The most frequently cited were a reduction in the delay of outpatient investigation and the use of ultrasound for liver biopsy.

Only 8% of specialist registrars anticipated achieving the simplest level of clinical ability A (table 1, question 5). Seventy eight per cent of trainees expected to reach the intermediate levels of either B or C, while just 14% anticipated achieving the comprehensive ability level D. Most specialist registrars (86%) therefore wished to be able to carry out a full hepatobiliary assessment without the ability to assess renal, pelvic, or other pathology. Most specialist registrars (73%) would not normally expect that a further ultrasound scan by a radiologist would be needed (table 1, question 6). The mean number of examinations expected by specialist registrars to be required to maintain competence (table 1, question 7) was 150 with a mean number of dedicated ultrasound sessions anticipated to be 0.75.

The results of the study to compare gastroenterology ultrasound requests with those originating from other clinicians are summarised in tables 2 (indications) and 3 (findings reported). The indications of abdominal pain, possible gallstones, and abnormal liver function tests were more frequent in gastroenterology practice (35%, 19%, and 20% of examinations compared with 15%, 8%, and 8% of examinations respectively) (table 2). The indications of haematuria, pelvic pain, pelvic mass, renal transplant follow up, and possible renal disease which together featured in 33% of the non-gastroenterology requested examinations, were not represented at all in our study sample of gastroenterology requests (table 2). The ultrasound findings of gallstones and fatty liver infiltration were more frequent in gastroenterology practice (16% and 12% of examinations respectively compared with 5.5% and 3.5% of examinations; table 3). Conversely, benign renal abnormalities were more frequent in non-gastroenterology practice (11% compared with 4% of examinations; table 3). In summary, gastroenterologists are more likely to request ultrasound examinations with indications relating to hepatobiliary disease and less likely to request ultrasound scans with the indications of pelvic or renal pathology. The findings of the scans studied are in accordance with the above trends of indications.

Discussion

Most gastroenterology trainees wish to train in abdominal ultrasound examination and most would be prepared to follow a training programme as outlined by the Royal College of Radiologists¹ if this were available to them. This decision does not seem to be greatly influenced by whether such training might be required for UK practice or only for European accreditation. However, most trainees thought that the most appropriate level of ultrasound ability to be attained by a gastroenterologist would exclude the ability to examine pelvic, renal, and adrenal pathology while including

Table 1 Survey form

Questions asked	Answers given
1 A summary of the Royal College of Radiologists' document is included at the end of this form. Would you be prepared to undertake the level of training suggested in this document if it were available to you?	68% replied "yes"
2 If the above training scheme was felt to be unnecessary to practice as a UK gastroenterologist, but only necessary in order to practice in some countries in Europe, would you still want to obtain such training?	80% replied "yes"
3 Are you interested in training to some degree in abdominal ultrasound examination?	77% replied "yes"
4 If your answer to the above was yes, what specific benefits to your practice do you anticipate from this training experience?	See results section
5 If you were to receive training in abdominal ultrasound which of the following levels of clinical ability would you anticipate reaching? (please tick the one most appropriate)	
A The ability to identify the gall bladder, assess its wall and detect calculi within it. Also to measure the common bile duct diameter and detect the presence of ascites	14% anticipated only reaching this level
B All the above plus the ability to assess the intrahepatic architecture for evidence of intrahepatic duct dilatation, fatty liver, cirrhosis and metastases. Also to assess splenic size	41% anticipated only reaching this level
C All the above plus the ability to assess the presence of varices, portal and hepatic vein patency and lymphadenopathy	37% anticipated only reaching this level
D All the above plus the ability to assess renal, adrenal, pelvic and other pathology	14% anticipated only reaching this level
6 If you were to achieve the level of ability itemised in your response to question 5, would you expect that patients would often require a further ultrasound scan to be performed by a radiologist? (Please answer either "always", "usually", "usually not", "rarely", or "never")	3.5% replied "always" 23.5% replied "usually" 54.5% replied "usually not" 17.5% replied "rarely" 1% replied "never"
7 How many ultrasound examinations per year do you feel a trainee should perform in order to maintain competence once trained?	Mean number 150 per annum
8 How many sessions per week would you anticipate dedicating to ultrasound examination once trained?	Mean number 0.75 sessions per week

Table 2 Breakdown of requests for ultrasound according to referring clinician

Indication	Non-gastroenterologists (n=89)	Gastroenterologists (n=96)
Gallstones	7	19
Jaundice	3	4
Abdominal pain	13	34
Weight loss	3	5
Dyspepsia	1	0
Metastases	6	0
Abnormal liver function	7	20
Ascites	4	1
Pancreatitis	2	1
Hepatomegaly	5	7
Haematuria	5	1
Renal transplant	5	0
Pelvic pain	3	0
Splenomegaly	1	0
Aortic aneurysm	8	0
Renal disease	14	0
Pelvic mass	2	0
Cirrhosis	0	2
Hepatoma	0	2

Table 3 Breakdown of ultrasound findings according to referring clinician

Finding	Non-gastroenterologists (n=89)	Gastroenterologists (n=97)
Normal	41	54
Gallstones	5	16
Dilated biliary tree	4	0
Dilated common bile duct alone	1	1
Liver cyst	2	0
Liver metastases	3	1
Ascites	4	0
Pancreatic abnormality	1	1
Aortic aneurysm	6	1
Benign renal abnormality	10	4
Splenomegaly	1	0
Pseudocyst	1	0
Cirrhosis	2	3
Fatty liver	3	12
Hepatomegaly	4	2

extensive hepatobiliary skills. This contrasts with the Royal College of Radiologists' guidelines including pelvic imaging as part of the course syllabus.¹ The study comparing ultrasound examinations requested by a department of gastroenterology with those requested by other clinicians also shows less frequent indications and findings relating to pelvic and

renal pathology in the gastroenterology requested examinations, with an increased focus on hepatobiliary indications and findings. The indications for ultrasound will vary to some extent with differing practice between individual units.

The level of experience required by an ultrasound practitioner in order to perform satisfactory diagnostic abdominal scanning is subject to several considerations. In urological outpatient practice it has been suggested that a restricted ultrasound scan performed by a urologist provides accurate and reliable information when the technique is learnt over some weeks.⁷ The details of the training undergone by the clinicians in that study were not, however, recorded. A restricted ultrasound training programme, excluding pelvic examination, would enable the majority of diagnoses to be made in gastroenterology practice. A policy of full history taking and clinical examination including urinalysis would be likely to reduce the prevalence of unsuspected renal or pelvic pathology among those patients scanned.

The extent to which hospital specialists should focus on their field of clinical interest is an area which has parallels worthy of debate in clinical examination as well as in imaging. For example, there is variability in the detail with which clinicians routinely examine the different systems at a new outpatient appointment. A patient presenting with dyspeptic symptoms who is otherwise well might or might not have his heart auscultated and blood pressure measured, depending on the usual practice of his gastroenterologist.

The interests of patients in receiving an optimum service are central to the Royal College of Radiologists' guidelines in the training of medical non-radiologists in ultrasound.^{8,9} This objective is the basis for the training of medical non-radiologists to a level of ultrasound ability comparable to that of trainee radiologists at the time of their successful completion of the final fellowship examination.¹ The cost and resource implications of training specialist registrars in

ultrasound according to the Royal College of Radiologists' guidelines are such that only a small proportion of specialist registrars could be expected to complete the imaging option module. If it is assumed that about a third of the costs would be used in theoretical training and the remainder for a practical module (300 scans minimum for the first module and 150 scans for a second or third module), restricting the practical module for gastroenterologists to hepatobiliary work (about half the abdominal syllabus) might save £1000 of the total of £3000 per trainee.

An alternative option to address the perceived need for the availability of ultrasound in the outpatient clinic would be the allocation of a radiologist or ultrasonographer to the gastroenterology clinic. While ideal, this is not likely to be an option as the need for the service is sporadic and will not be practical in most centres due to the general shortfall of radiologists. There is no regulation on the practise of ultrasound to prohibit any clinician offering the service, though it would not of course be desirable to expand into this field without adequate training. The maintenance of ability once trained is very important and it should be noted that specialist registrars' estimations of the number of ultrasound examinations per annum needed to maintain competence and of the number of sessions they would be able to dedicate to ultrasound are both less than recommended in the Royal College of Radiologists' guideline document.¹

The role of ultrasound in the safe practice of percutaneous liver biopsy is a separate area and one which was often cited by specialist registrars as a potential benefit to their practise from ultrasound training. The British Society of Gastroenterology audit of liver biopsy suggested that ultrasound guidance should increasingly become part of routine percutaneous liver biopsy.¹⁰

In Europe, ultrasound skills form part of gastroenterology training in all other countries. In Germany, Austria, parts of France, the Benelux countries, and parts of Scandinavia, it is routine practice for gastroenterologists to perform abdominal ultrasound within their general examination of the patient. This is usually done in the outpatient clinic with a portable machine, although many gastroenterological services also have a machine for ward use. These tend to be used to exclude relatively straightforward problems such as gallstones and dilated bile ducts, leaving complicated investigations such as Doppler studies to specialist radiologists. Gastroenterologists in these countries only rarely provide a service for patients not under their care (Rhodes J, personal communication). A Swiss radiologist has expressed scepticism of the value of unrestricted, non-radiological ultrasound practice.¹¹ His department performs 90% of the total ultrasound examinations using five machines; five others distributed throughout various specialist departments are relatively

underused. Elsewhere in Switzerland, radiological involvement in ultrasound, and presumably therefore, efficient use of equipment and maintenance of operator skill, is more patchy.

In the UK, it remains to be seen whether readily available, specialty specific, ultrasound in various departments can deliver a cost effective service to patients of assured quality. If it can, then specialist registrar training in gastroenterology should probably be focused on gastrointestinal areas only. If it cannot, then either gastroenterologists should undertake the full module as proposed by the Royal College of Radiologists or leave the technique to others with greater expertise. With increasing public awareness of potential variations in medical care both between and within institutions it is likely that those practising ultrasound will be required to have the necessary qualifications and to maintain their skills.

In conclusion, the majority of gastroenterology trainees wish to train in ultrasound and most would be prepared to receive training according to the Royal College of Radiologists' guidelines if this were available. Ultrasound training is both expensive and limited by current training resources. Financial costs and available training resources would be somewhat reduced by limiting gastroenterological ultrasound training to hepatobiliary skills. Most gastroenterology trainees perceive a restricted focus of abdominal ultrasound training to be most appropriate to their clinical needs. The case mix of gastroenterology ultrasound examinations tends to support this viewpoint. Whether a limited training in this field is commensurate with providing an optimum service to patients requires further discussion.

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