Table 1 Findings on thoracic ultrasound (TUS)

Finding on TUS	No (n = 102)
Simple effusion	77
Small	31
Moderate	29
Large	17
Septae in effusion	9
Collapse/consolidation	14
Pleural thickening	4
Other findings	11

The size of the effusion on TUS was estimated to be small if <1 cm in depth, moderate if 1–3 cm in depth and large if >3 cm in depth. Other findings included mass lesions, consolidation and a raised hemidiaphragm. Some patients had more than one abnormality on TUS.

in a gradual reduction in the number of radiology departmental procedures from 63 to 17 per annum.

A recent audit of our activity showed that over a period of 18 months, 102 bedside TUS procedures were performed (table 1). The main indications for TUS included confirmation of the presence of a small pleural effusion, and guidance for pleural procedures. In 71 cases TUS confirmed the radiological findings, with discordant findings in the remaining 31 cases. The TUS findings were crucial in 30 cases, showing either an absent or a very small pleural effusion, not suitable for an invasive pleural procedure. In a further 10 patients TUS facilitated case monitoring. TUS provided guidance in all cases requiring a pleural procedure; 48 and 8 for chest drain insertion and needle aspiration, respectively. None of the subsequent procedures had any associated complications.

Use of TUS decreases the complications associated with pleural procedures,² which may result in serious harm or even death.³ Recent British Thoracic Society advice on chest drain insertion has advocated the use of ultrasound image guidance.⁴ Our experience confirms that TUS can be employed by respiratory physicians both as a diagnostic aid and for guiding procedures, and not just in major centres. Cost benefits also accrue from a decrease in the number of scans performed in the radiology department, and in the time involved in waiting for them. Therefore, we would support increased use of this technique by respiratory physicians, after appropriate training, for which guidance already exists.⁵ The recognition of the characteristics of malignant pleural effusion as described by Qureshi and colleagues may, however, require a higher level of expertise in the interpretation of TUS findings, as well as

the use of high frequency ultrasound probes.² This may have training implications for respiratory physicians if we wish to maximise the potential benefits of TUS in diagnosing malignant pleural effusions, rather than limit the technique to the support of diagnosis of pleural effusions and safer invasive procedures.

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Authors' reply

We would like to thank J A Kastelik *et al* for their letter in response to our recent *Thorax* publication.¹ As the letter describes, we entirely agree that thoracic ultrasound is a technique which is becoming more commonly practised by chest physicians, and there is good and increasing data in support of this technique as a sensitive diagnostic test for pleural effusion, and as the safest mode of guiding pleural intervention. We further agree with the data presented from their local audit that this chest physician-based activity may result in a decrease in radiology department activity for pleural procedures and thoracic ultrasound. This does have training implications, not only for chest physicians hoping to accrue the necessary skills to perform thoracic ultrasound as part of routine practice, but also for trainees in radiology who may no longer have the opportunity to conduct pleural procedures under ultrasound guidance.

The findings of our study suggest that thoracic ultrasound is a sensitive and specific

diagnostic test in a population of patients with suspected malignant pleural effusion. It is important to note that these scans were conducted by radiologists (NQ and FVG). We believe that conducting an extensive thoracic ultrasound scan for the diagnosis of malignant pleural disease is likely to be beyond the remit of level 1-trained thoracic ultrasound practitioners.² Most chest physicians will use thoracic ultrasound for detection of pleural effusion and guided procedures (level 1). The features we described in our article (assessment of parietal pleural thickening, visceral thickening, nodularity and diaphragm anatomy abnormalities) may be subtle and require some experience to recognise. It is therefore likely that only radiologists and chest physicians with a high degree of experience will be in the position to assess similar criteria in the clinical situation. It is also likely that the majority of chest physicians will train to level 1 competence in thoracic ultrasound, with a few number (eg, those with an interest in pleural disease in specialist centres) training to level 2 competence.²

Although Kastelik *et al* have suggested that higher frequency ultrasound probes may be necessary to detect these abnormalities, in our study all features were visible using a 3–5 Hz curvilinear abdominal probe.¹ We initially used a higher frequency probe to assess for subtle thickening and nodularity, but in fact abandoned its use for the study as it led to no increase in diagnostic yield and substantially increased scanning time.

Once again, we would like to thank the authors of the letter for their interest in our study.

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