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as shown in the prospective study by Goodman *et al*¹⁸ using CT as the gold standard, small pneumothoraces may fail to be detected. The CXR is undoubtedly unreliable in the detection of small pneumothoraces in the supine patient²² and in specific clinical circumstances, as suggested by Agricola *et al*, ultrasound may be of value. This being the case, we agree that if a suitably skilled operator and ultrasound equipment are available at the patient's bedside then ultrasound may provide useful diagnostic information, but we maintain that it is unlikely to obviate the need for a formal CXR.

We are surprised that the authors experienced significant delays in obtaining 'stat' portable CXRs in their critical care and emergency departments and that patients may have died as a consequence. Clinicians managing critically ill trauma patients require rapid access to portable CXRs and all institutions managing such patients should be able to deliver this.

In conclusion, we agree that in supine and trauma patients ultrasound may be a valuable tool in the detection of pneumothorax. In these patients, ultrasound may have increased sensitivity compared with a CXR, although difficulty with pneumothorax quantification suggests that ultrasound is unlikely to completely replace the need for a radiograph. In the majority of cases of spontaneous or postprocedure pneumothorax, ultrasound is unlikely to provide additional benefit over the combination of CXR and clinical judgement when deciding management.

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Competing interests None.

Provenance and peer review Not commissioned; not externally peer reviewed.

Accepted 30 November 2010

Published Online First 30 December 2010

Thorax 2011;**66**:829. doi:10.1136/thx.2010.156398

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Authors' response

We thank Agricola and colleagues¹ for their compliments on our guideline² and their contribution to the discussion on the role of ultrasound in the detection of pneumothorax, but we maintain that the medical community should proceed with caution when using ultrasound in the detection and management of pneumothoraces. If the reviews^{3–7} referenced are not considered (5 papers), 13 of the remaining 24 papers referenced are in two well-defined patient groups—trauma^{8–16} and post-intervention.^{17–20} None of the papers published prospectively demonstrated improved outcomes and management change using ultrasound in comparison with chest x-ray (CXR), and perhaps more significantly only one prospective blinded study in medical patients with varying degrees of respiratory compromise has been reported and this demonstrated an unacceptably high false positive rate.²¹

We maintain that ultrasound is limited in its usefulness in the assessment of cases of spontaneous pneumothorax and following pleural procedures particularly in settings outside critical care. Many of these patients have underlying lung disease, particularly chronic obstructive pulmonary disease, which reduces the accuracy of pneumothorax detection by ultrasound.²¹ If a pneumothorax is detected by ultrasound, a CXR is usually required to assess its size (unless a CT scan is then performed). If the pneumothorax is so small as to be undetectable on CXR, then it is unlikely to require intervention and the use of ultrasound will not have changed the management.

We acknowledge that in the assessment of a supine patient thoracic ultrasound performed by a skilled operator may detect even small pneumothoraces (and effusions) and that if these patients require positive pressure ventilation detecting even a small amount of pleural air may be relevant. Even so, in this group, caution is needed because,