Bedside Ultrasonography for Evaluation of Pneumothorax

To the Editor:

We read with great interest the article by Ding and colleagues\(^1\) in a recent issue of CHEST (October 2011). According to their random-effect meta-analysis, pleural ultrasonography (PUS) was more sensitive than, and of similar specificity to, chest radiograph (CXR). They also indicated that PUS is an attractive alternative to CXR in EDs and ICUs and that PUS is a “rule out” test. Although we strongly agree that bedside PUS is very helpful and a readily available tool with very good sensitivity and specificity to detect pneumothorax, we have some concerns.

First, understanding the goal of the study, which was to estimate the accuracy of PUS and CXR from previous studies, we believe that the analysis included a very diverse sample of studies, including retrospective studies with one arm, old studies (some before 1995), some with a low number of subjects (especially on the PUS arm), some with blinding issues, and, in general, studies that included diverse patient populations. In fact, the \(F\) statistics indicated very wide heterogeneity. Attempts were made by the authors to explain some of that heterogeneity by doing subgroup analysis and metaregression. It may be better to include recent ICU or ED studies that have a comparison arm with CXR or the gold standard (chest CT scan) and that meet the quality criteria (Quality of Diagnostic Accuracy Studies and Delphi criteria) to obtain more accurate estimates.

Second, PUS is not a very accurate method to estimate the pneumothorax volume. If used alone, PUS can lead to overtreatment with a possibly invasive procedure that can potentially cause more harm than benefit.

Third, we agree that PUS can be an alternative to CXR, but only in a small section of pneumothorax patient populations. In addition to the weak ability of PUS to estimate a clinically significant pneumothorax, it is not accurate in patients with large peripheral bullous emphysema. It also has some other limitations mentioned by the authors, such as the presence of pleural adhesions, pleural calcifications, and subcutaneous emphysema.

We believe that the findings of this analysis do not show that PUS should be used alone and universally on all patients. CXR is still needed in patients who are relatively stable with pneumothorax seen on PUS before deciding on chest tube thoracotomy. Furthermore, the training with bedside PUS in the ICU that is being incorporated in most Pulmonary, Critical Care, and Emergency Medicine fellowship programs in the United States and familiarity with PUS and pneumothorax signs (lung sliding, lung point, and comet tail) are essential before using PUS to make decisions.

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Response

To the Editor:

We thank Dr Alrajab and colleagues for their comments on
our recent article in CHEST.1 Their suggestions and opinions on
the key points relating to the diagnosis of pneumothorax (PNX)
by ultrasonography will also benefit our research. Our responses
to their comments are as follows.

First, the extent to which a Cochrane review can draw con-
clusions about the effects of an intervention depends on whether
the data and results from the included studies are valid. For our
analysis, the most valid studies would have been prospective,
double-blind studies with a large sample, which would have had
the same gold standard for comparison. However, there were only
a few studies which complied with these criteria. All of the
20 studies we included in our analysis complied with at least seven
of 10 quality of diagnostic accuracy studies tool items (shown in
e-Table 1 of our article1), and the study published in 1995 com-
plied with nine of 10 quality of diagnostic accuracy studies tool
items. The possible sources of heterogeneity across the studies
were explored using metaregression analysis, which implied that
heterogeneity resulted from factors other than the way in which
a study was designed.

Second, in our experience and in the opinion of other experts,2
the accuracy of plural ultrasonography (PUS) in diagnosing PNX
depends on the operator’s skill. The lung point is a specific sign
that allows PNX to be confirmed and the PNX volume to be
determined. Furthermore, not all of the PNX diagnosed by PUS
requires an invasive procedure. Only a large PNX needs emer-
gency treatment. In these circumstances, a well-trained operator
can evaluate PNX precisely with PUS. For mild to moderate PNX,
clinicians can wait for the results of CT scans or chest radiographs
(CXRs) before performing an invasive procedure.

Third, we indicated that PUS complements CXR rather than
replaces it. Both PUS and CXR have advantages and limitations in
detecting PNX. There is no conflict between these two modalities.
The choice should be made depending on the specific conditions,
including available equipment, clinician ability, and patient
circumstances. PUS and CXR each have a role in detecting PNX.

Sufficient training and certification of the operator are essential
before performing PUS. Despite the limitations of PUS, from our
analysis we believe that it is a promising alternative for the
diagnosis of PNX, especially when performed by clinicians in
critically ill patients.3

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Increased Adverse Events After Percutaneous Coronary Intervention
in Patients With COPD

To the Editor:

In reference to the recent article by Enriquez et al (September
2011), we commend the authors for highlighting the problem of
significantly lower rates of β-blocker and statin therapy given to
patients with COPD. This finding suggests that patients with
COPD may be undertreated for concomitant cardiovascular dis-
ease. In a similar vein, we previously reported on statin therapy in
subjects undergoing evaluation for lung transplantation in whom
pulmonary hemodynamic data were available and found that only
67% of subjects with angiographically proven severe coronary
disease (CAD) were receiving statin therapy prior to evaluation.2

Applying a more liberal definition of CAD to include any degree
of angiographically observed coronary disease, only 42% of the
patients used statin therapy. Patients using β-blockers found to
have severe vs any CAD on angiography was very low at 11% and
5%, respectively.

It has been demonstrated that COPD is associated with excess
cardiovascular disease even after controlling for potential con-
founders, such as tobacco exposure.3 These studies, however, are
not able to account for treatment differences, which could signif-
ically affect the observed associations. The study by Enríquez et al4
has implications applicable both clinically and for future research
design. Clinically, physicians should work to challenge the mis-
perception that β-blockers are contraindicated in COPD. Data
clearly show that cardioselective β-blockers are well tolerated in
COPD and should not be withheld for this reason. The dispari-
ty of statin prescription is somewhat perplexing and perhaps
explained by the observation of favorable lipid profiles, which
may be associated with COPD.5 In terms of future research
design, it is clearly imperative that studies of CAD in COPD take

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