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**Impact of lung ultrasound
on clinical decision making
in critically ill patients:
response to O'Connor et al.**

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Dear Editor,
We would like to thank Drs. O'Connor, Isitt and Vizcaychipi [1] for their interest in our paper [2] as well as for giving us the opportunity to better clarify our results. In our study 253 lung ultrasound (LU) examinations were performed in 189 patients. Thus some patients underwent more than one LU study. In these patients, the majority of whom had prolonged ICU stay, all LUs were performed for a new suspected diagnosis which was not related to the first examination. Therefore for net reclassification improvement (NRI) calculation, only LU examinations performed for new suspected diagnoses were used. Although in several cases repeated LUs were performed to follow up the condition of the patients, these results were not used (and not reported) in the study. Therefore we believe that NRI calculation is clear and not contaminated with repeated follow-up LU examinations.

We certainly agree that our results are heavily influenced by the

expertise of one of the authors (NX). Although LU can be performed by almost all attending physicians in our unit, we decided, for the purpose of a uniform interpretation of the findings, to involve a single experienced operator in our study. This should also minimize the influence of the variability of operator bias on the results, as the operator simply presented the findings to the primary physician and was not responsible for further patient management. However, since in our previous study the LU findings were comparable to those obtained by CT scans [3], it is likely that the impact of LU on decision making is influenced by the reliance of the attending physician on the LU examination. There is no question that this represents a major limitation of the study and may make it difficult to replicate in other ICUs. We believe that in order to use LU in the decision-making process a kind of validation procedure should be performed first. In particular, the LU diagnosis of pneumothorax represents a challenge and we thus believe that the operator should feel confident about his/her skills in interpretation of LU findings that support or exclude this condition.

We agree that in our study [1] the suspicion of pneumothorax was high. This high index of suspicion was due to several reasons. Firstly, by study design all patients were on mechanical ventilation, a well-known risk factor for pneumothorax. Secondly, several of our patients suffered from multiple trauma and/or ARDS necessitating the application of high PEEP and recruitment manoeuvre, forcing the primary physician to order an LU to address the issue of pneumothorax. Thirdly, in several cases the primary

physician easily ordered an LU to confirm/exclude the diagnosis of pneumothorax even without strong clinical evidence for this complication. This decision was driven by the excellent diagnostic accuracy of LU for pneumothorax shown in our previous study [2]. However it is of interest to note that in 35 out of 253 LU examinations (14 %) the diagnosis of pneumothorax was made [1]. These results highlight the value of LU in diagnosing this complication which in mechanically ventilated patients may be devastating.

Conflicts of interest None.

References

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