Reviewer's report

**Title:** Predictors for length of hospital stay in patients with community-acquired Pneumonia: Results from a Multicenter study

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**Reviewer:** ALBERTO Capelastegui

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This paper undertakes a secondary analysis of the information obtained during a prospective multicenter study carried out at 6 Swiss hospitals between October 2006 and March 2008. Its main goal is to derive a new prediction rule in patients hospitalized with CAP (community-acquired pneumonia) which enables LOS (length of hospital stay) prediction on admission and during follow-up.

The authors have been able to identify some factors, both at admission and during evolution, which are independently associated with longer LOS. Variables are weighted and a score is established.

The article is well written, interesting and could help doctors in the management of these patients.

Some aspects of the article could be improved:

**Major compulsory revisions**

1- For a topic such as LOS in CAP, which shows enormous variability between hospitals and between countries, the validation of a predictive rule like the one reached in this article would be very convenient. The authors assume this as a limitation, and their reflexion is acceptable.

My question would be: could they have divided their cohort into two, so as to derive the rule with one half and validate it with the other half?

2- LOS in Swiss hospitals is very high (9.8 days) when compared with that registered in other countries and in other studies. I agree that this high LOS can also be found in other European countries; however, it has been proven that once clinical stability has been reached (+/- 4 days) hospital admission is not justified. This leads one to question whether those average 9.8 days for length of stay don't depend more on aspects related to management rather than aspects related to clinical variables. The discussion should expound on this topic, while at the same time making reference to the widespread interest that the application of this predictive rule could have, if we take into account that there are still many countries and many hospitals in Europe with high average figures for LOS. There are still many areas surrounding LOS in patients admitted with CAP that warrant improvement and a rule like this could help.
3- The information they provide about the Kaplan Meier curves is very interesting; however it would be interesting to study in greater depth the evaluation of the rule's performance. For example, evaluating the rule's discrimination (AUC) or even its calibration: Hosmer-Lemeshow P values. If these values, particularly AUC were shown to be high this would really strengthen the value of this rule and above all it would underline the impact of clinical variables in the prediction of LOS. I have my doubts that this would be the case, since I think that factors besides the purely clinical (i.e. social, logistic, tradition... aspects tied to management in general) have a lot to do with LOS, especially when it averages around 10 days.

Minor compulsory revisions

1- The information about the design and setting of the study should be expanded so that consulting reference 12 does not become a necessity to follow the article.

2- The authors should justify in detail and convincingly that the intervention undertaken in the original project had no effect on LOS. The reasoning that the procalcitonin group in the ProHOSP trial was similar to the guidelines group with respect to LOS is not enough.

3- I am sceptical about the following assertion made in the discussion: (page 10, 1st paragraph) "This suggests that extent and severity of infection are not predominant factors influencing LOS...". There are several previous studies that prove the opposite. It is possible that with a LOS of 9.8 days the severity of the illness may not figure as a determining factor for LOS. However, it is very likely that severity of illness may affect LOS if the average were to be 4 days instead.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests