**Reviewer’s report**

**Title:** Using Ordinal Logistic Regression to evaluate the performance of laser-Doppler predictions of burn-healing time

**Version:** 3  **Date:** 26 November 2008

**Reviewer:** Joel Coste

**Reviewer’s report:**

This paper aims to evaluate the performance of laser-doppler imaging (LDI), used between days 2 and 5 post burn, to predict the healing time of burn. Random-effects ordinal logistic regression models (mainly proportional odds models) were used to deal with multiple burn areas in patients and with an ordinal outcome criterion (healed before 14 days – between 14 and 21 days and after 21 days).

Although the study addresses the important topic of prediction of ordinal outcomes and was technically well conducted, I found the paper is presented in a way that it becomes incomprehensible and confusing (and unnecessarily lengthy).

**Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)**

1. The paper’s structure should be revised to follow the classical sections: “Background – Methods (setting, patients, measures, statistical methods) – Results – Discussion – Conclusions”.

2. The ordinal nature of the outcome criterion should be better substantiated (scientific argument and references). Why 14 and 21 days are important cut-offs points in clinical practice?

3. There has been some debate and a lot of publications about the various ordinal regression models, their different results and their (often) poor classification performances. These problems should be addressed more carefully, referring to the proper literature. I missed very important authors/papers that contributed to the same area of research. The place of the present paper in the existing literature, and thus its added value, would have appeared more clearly.

4. The rationale for choosing the PO model (rather than CR and multinomial models) should also have been presented (and also the rationale for specifying the random effects covariance structure).

5. The strategy for identifying (and controlling for) the important covariates (being either confoundings or effect-modifiers) such as gender, age or %TBSA and so on should be detailed and somewhat substantiated. Here too, referring to the
proper literature would help the reader understand which hypotheses should be tested and/or how the models could be (soundly) constructed.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Provide the definition of “healing” in this study

2. Explain how censored data (i.e. patients dying before 14, 21 days ?) were handled.

3. Explain (and reference) D01AMF, E04UCF, E04CCF

4. The likelihood function is sometimes denoted “L” and sometimes “l” – Theta or beta symbols are also used interchangeably on page 7.

Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)

A flow chart of patients, visits, deaths etc would be useful

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests