Reviewer’s report

Title: The ChromaTest, a Digital Color Contrast Sensitivity Analyzer, for Diabetic Maculopathy

Version: 2 Date: 28 April 2008

Reviewer: Richard Holubkov

Reviewer’s report:

The subject matter of your report is outside of my area of expertise, this I will confine this review primarily to biostatistical issues. I will jump right into presenting my comments in terms of mandatory and optional revisions.

Major compulsory revisions:

1. The first and foremost issue is that, very respectfully, I do not have a high confidence at this moment in some of your key statistical analyses. It is likely proper to perform a Wilcoxon test rather than a t-test on the PCCT and CSMO data, as you do. However, I was concerned that your manuscript states that the Wilcoxon test was done in Excel, without giving a reference to a program or add-on that facilitates performing this test in Excel. I therefore copied the data from the PDF version of your original submission to SAS, and performed the Wilcoxon two-sample test using SAS PROC NPAR1WAY. I concluded from this analysis (the median values agreed with those in the text of the revised version) that PCCT was significant between NPDR and CSMO at about p=0.01, while NCCT was highly significant at p=0.0002 or so. I cannot address the controls, as I do not have this data (by the way, as a “Minor Essential Revision”, you should state somewhere in your manuscript precisely what the sample size is for the control group!).

Thus, assuming I have used the correct data in my informal analysis attempts, I believe you must perform the key Wilcoxon analysis, and perhaps others, using bona fide statistical software. I do not know if you have access to SPSS or SAS or some other packaged software? If not, in terms of using freeware, I would recommend downloading R from www.R-project.org, saving your data as csv format in Excel, reading into R using the read.csv() function, and then performing the Wilcoxon test using Wilcox.test() or Wilcox.exact().

2. In Table 1, what does the chi-squared test statistic refer to? Is this simply that the proportions of (say) test positive versus test negative are different between the true positive and true negative groups? Please clarify. The CI’s seem to be left blank in the Table, although these are given in the text.

3. In the final paragraph of Results, how did you calculate the p-values to demonstrate that sensitivity “improves” (among the higher logMar BCVA patients?). Is this a chi-squared test simply comparing sensitivities in these patients versus the others? Please clarify.
Minor essential revisions (already noted above)

4. State sample size of control group at appropriate place(s) in manuscript.

5. Label Figures, and/or Figure legends, with relevant sample sizes.

Discretionary revisions:

6. I would also suggest, if possible, showing 95% confidence intervals for the differences between groups from the rank-based tests you perform, though this is not absolutely necessary. If you choose to attempt to do this in R, I would refer you to Dr. Charlie Geyer’s excellent webpage at the University of Minnesota:

http://www.stat.umn.edu/geyer/old02/5601/examp/ranksum.html

7. Your three Figures show Tritan and Protan values for the three patient groups separately. Might it not be more helpful to the reader to instead show the Tritan and Protan values, separately in two plots (or perhaps sets of boxplots?) that have the three different patient groups shown (as different symbols) on the same plot? Something to consider; at least, I found myself wanting to see the data in this way when trying to figure out the between-group comparisons. Whatever plots you choose, please do show the relevant n’s (group sizes) in the Figures or Figure Legends.

8. My only non-statistical comment is that I found it slightly awkward as a reader to have two new references introduced in the Conclusion paragraph. You may wish to move relevant materials to the Discussion.

Level of interest: An article of limited interest

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.