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Title	A mixed methods pilot study comparing resident's performance using digital and glass slides for the Royal College certification examination in pathology
Authors	Lorna Mirham MD, Christopher Naugler MD FRCPC, Malcolm Hayes BSc MB ChB LRCP FRCPath FRCPC, Nadia Ismiil MD MBChB FRCPC, Annie Belisle MD FRCPC, Shachar Sade MD MSc FRCPC , Catherine Streutker MD FRCPC, Christina MacMillan MD FRCPC, Golnar Rasty MD FCAP FRCPC, Snezana Popovic MD FRCPC, Mariamma Joseph MD FRCPC, Manal Gabril MD FRCPC, Penny Barnes MD FRCPC, Richard G. Hegele MD PhD FRCPC, Beverley Carter MD FRCPC, George M Yousef MD PhD FRCPC
Reviewer 1	Dr. Henry Schneiderman
Institution	Hebrew Health Care, West Hartford, Connecticut
General comments (author response in bold)	1. The topic addressed in this article is an important and timely one, but clearly the technology is not yet up to the task of making the (worthwhile, ultimately helpful) transition from the glass-slide-based certifying examination and daily practice, to a digitalized slide-based practice and certifying examination. Thus while the individual elements are worthwhile, a subtitle to the effect of ":an interim report" might better alert the reader in advance that the desired outcome has not yet been achieved and will likely take several more years to be practical--as these authors very sensibly and soberly state and imply at several points in the manuscript. All that said, I think a shortening of the article is feasible, and that in a somewhat briefer form it would achieve the sharing of information/updating about the state of this art; and that the journal reader would be less likely to feel unsatisfied at the end of the article if its length, title, and perhaps abstract announced that the effort to move to digitalize will need more work, time and technologic advance to be achievable. **Author response:** We agree with Dr. Schneiderman that digital pathology is not ready for prime time routine use for diagnosis, as we highlighted in our response to the editors above. There are, however, a number of focused applications (such as Operating room consults, telepathology consults, etc.,) where digital pathology is coming into reality. To convey the concern of the Dr. Schneiderman, we have now clearly specified in our revised manuscript that the main objective of this study was to answer the specific question of whether a fully digital Royal College examination for Anatomical Pathology a feasible idea. On behalf of the authors, I am also happy to inform you that the results of this study were positively accepted by members of the Royal College examination board, and there is now a positive move towards a fully digitizing the Royal College examination and this has been taken to the next level of discussion. We also acknowledge the concern of Dr. Schneiderman regarding the fact that the outcome of the design is likely to take several more years to be achieved on a practical ground. We have now added a statement in our revised manuscript to address this point. We have also made our best efforts to make the manuscript more concise, however, this has to be taken into the context of the editors comment s that required adding more sections and many more specifications related to study design. 2. I am wary of the number of authors; one does wonder if each of them made an individual, substantive contribution to the manuscript; we all wish to promote teamwork and to reward effort, interest and initiative; but an acknowledgement is sometimes more apt than co-authorship, even if proliferation of author numbers is rife in the biomedical literature now. **Author response:** We fully understand the concern of Dr. Shneideman about authorship. In the meantime, we would like to verify that this is a large study that required a lot of efforts from many members, in the centres across the county. It included two large components; which are the digital and the glass slide examination, to be administered in the different centres. In addition, background work included extensive preparation of the slides for the examination in order to simulate the real Royal College examination as much as possible. That includes a careful choice of slides from a large database of slides, preparing recuts, digitizing the slides, quality assessments of both glass and digital images. In addition randomizing the candidates, administering the test and making sure results were recoded. Taking this into consideration, it would be unfair to eliminate any of the authors that participated in this study. 3. Finally, some of the grammar, word choices and punctuation are not optimal, and detract from the efficacy of communicating the messages of this paper. Whether one or more of the authors could improve this, or whether a professional editor might help, I believe this is a worthwhile endeavor to enhance the impact of the paper; and hope that I will not be perceived as a fuss-budget or a curmudgeon for saying so. **Author response:** We have done our best to improve the quality of the grammar and structure of the sentences as advised by the reviewer.
Reviewer 2	Dr. Andreas Scorilas
Institution	University of Athens, Greece
General comments (author response in bold)	The present article is an interesting work regarding the use of digital instead of glass slides and its effect on diagnostic performance, based on tests carried out by senior pathology residents throughout Canada. The study provides valuable conclusions that should be taken into account

	during the process of replacing conventional glass slide diagnosis with digital images. Overall this is a well written manuscript; some minor issues, described further below should be addressed: **Author response:** We would like to thank Dr. Scorilas for his very positive and overall impression about the quality and the significance of the manuscript. 1. Abstract: Easier transfer and archiving of data as well as allowing the opportunity for easier cross-evaluation and remote consultation should be also added here. The most significant concerns raised by the residents should also be presented. **Author response:** Abstract: we have now added the extra information highlighted by Dr. Scorilas as well as the concerns raised by the reviewers. However, we did our best to accommodate many of the comments but space limitations were an obstacle for adding every single comment. 2. Introduction, page 6: "viewed in high resolution on a computer screen" could be a better description. **Author response:** We have now refined our statement as advised by Dr. Scorilas. We have included a clear description of the range of specimens used, that include, types of specimens (large resections vs. small biopsy specimens) and the organ systems in addition to the type of diagnostic entities including inflammation, cancer, normal, etc. 3. Materials and methods: A brief description of the types of pathologies that were assessed should be given. It would be also interesting to see if there was a statistically significant difference in performance between glass slides and digital images within various pathologies and/or in "difficult-to-diagnose" cases. **Author response:** Dr. Scorilas also raised a very important issue of the potential presence of significant performance differences between the different diagnostic categories or difficult to diagnose cases. We reassessed our data and our analysis showed no significant differences in performance that is related to the various diagnostic categories or specimen types. 4. Materials and methods: More details should be given regarding the hardware and the software that were used for digitizing the images, as well as regarding the quality (resolution or pixel density, image size etc) of digitized images. Additionally, it would be helpful to report the actual software that was used for viewing the images in different examination centers as well as the microscope types/models that were used for assessing the glass slides. **Author response:** We now provided more details regarding the hardware and software that was used to create the digital images. We were again however, constrained by the request from the editorial office and Dr. Schneiderman to make the manuscript more concise. 5. Results: The overall evaluation performance among different centers could be presented here. **Author response:** The overall performance among different centres is presented in supplementary table 1. There were no significant differences in the performances of the residents in different centres. 6. Results-Discussion: All the concerns that were raised by the participants (e.g. namely software functioning too slowly, image blurring and poor detail of images), refer to, mainly, software and perhaps some hardware issues that could be easily solved with recent technological advances; this should be stressed out. **Author response:** Dr. Scorilas raised a very important point that many of the concerns raised by the residents are related to software and can be easily resolved with recent technological advances. That has been now clarified in the revised manuscript. 7. Discussion: Another alternative approach that could be mentioned is the assessment of some common random cases using glass slides and digital images by the same participants and the analysis of any differences between the two evaluation methods. **Author response:** We feel that we were not very clear in presenting the way we structured our study. We did compare identical sets of glass vs digital slides. Two different sets were used. Each set included a combination of cases. The two sets, A and B , were used and compared. 8. Discussion: Page 15, last paragraph: The feedback from the pathologists and residents that is mentioned in the recent survey (e.g. major concerns, advantages identified) could be compared with and discussed in relation to the feedback provided by the present study. **Author response:** We would like to thank Dr. Scorilas for raising this interesting point of comparing the results of our survey with the feedback provided by the recent study done by our group. We have now added this valuable comparison to our revised manuscript. 9. High cost of processing images should be given with a rough estimation; maybe this is not such a limiting factor when also taking into account the cost reductions that should arise by digitally archiving and sharing cases, or the reduction of microscope use. **Author response:** It's very difficult to have a single estimate for the processing costs of digital slides. The main cost is in obtaining the digital slide scanner which is now available in most major university hospitals across Canada. The additional costs of digitizing the slides, as correctly stated by Dr. Scorilas will be minimal. We have now added his valuable comment in our revised manuscript.