

In the paper we claim, “Furthermore, no studies comparing sensors of different models, using objective quantification of key image quality parameters, could be found in the literature.”<sup>1</sup> Taking the comments from Drs. Mah and Udupa into consideration,<sup>2</sup> we still believe that this is true. This is a consequence of our definition of objective methods, as expressed in the beginning of the discussion: “The results obtained using objective methods are produced by mathematical algorithms applied directly to image data and do not rely on the subjective assessment of image quality by radiologists.”<sup>1</sup> This means that no viewing of quality assurance (QA) images or assessment of graphs is done by a human observer. All QA data produced come from direct analysis of the digital image data, and there is no human interpretation of the results.

In references 2, 3, 5, and 6 in Drs. Mah and Udupa’s letter,<sup>2</sup> evaluation and interpretation of QA results is consequently done by human observers. In our opinion, such QA methods are based on subjective evaluation and interpretation. We have not been able to find reference no. 4, as this obviously is in the proceedings of a conference and is not a published paper.

In summary, we and Drs. Mah and Udupa evidently do not have the same opinion as to the meaning of the concept objective QA methods.

Sincerely yours,

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quality assessment. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2016;121:e129-e137.

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## Response to the article “Comparison of the performance of intraoral X-ray sensors using objective image quality assessment”



*To the Editor:*

This letter is in response to an article titled “Comparison of the performance of intraoral X-ray sensors using objective image quality assessment” published online May 5, 2016.<sup>1</sup>

We are pleased to see the publication of research stressing the need for more objective assessments for quality assurance with digital intraoral systems. Other researchers, Mol and Yoon, have similarly stressed the need for the use of objective assessment of digital intraoral systems, in the publication “Guide to digital radiographic imaging.”<sup>2</sup> We too have conducted research in this area, and, as such, we wish to correct a statement made by the authors.

In the paper, the authors state, “... no studies comparing sensors of different models, using objective quantification of key image quality parameters, could be found in the literature.”<sup>1</sup> In fact, objective assessment of imaging parameters with digital intraoral systems has been previously presented by our team as well as at other academic and commercial research institutions.

Our team published a paper titled “Quality assurance phantom for digital dental imaging,”<sup>3</sup> presenting a method whereby objective assessment of physical imaging parameters is done to determine the optimal exposure of a digital imaging system and to ensure longitudinal quality assurance on a periodic basis.

Another paper by Verdú et al., titled “Specific developed phantoms and software to assess radiological equipment image quality,”<sup>4</sup> presents an alternative objective method to assess imaging parameters with digital imaging systems.

A third paper, “Evaluation of image quality parameters of representative intraoral radiographic systems” by Udupa et al.,<sup>5</sup> presents an evaluation of 20 different intraoral digital systems using an objective assessment of the physical parameters. The following is found on page 777 of that paper, where the authors clearly state: “Spatial resolution (SR) and contrast/detail detectability (C/D) were measured for all images using image analysis software where

applicable (UTHSCSA ImageTool; University of Texas Health Science Center at San Antonio, San Antonio, TX, USA).”<sup>5</sup>

Finally, another paper, “Digital intraoral radiographic quality assurance and control in private practice,” used an objective assessment of the “high contrast resolution as defined by the number of visible line pairs/mm . . . measured utilizing the ImageJ software.”<sup>6</sup>

There are at least two products available commercially to perform objective assessment of physical parameters of digital intraoral radiographic systems for quality assurance evaluation. One such product is the Digital Dental Quality Assurance Phantom (<http://www.dentalimagingconsultants.com/Products.aspx>). Another is the CD DENT Phantom (<http://www.southernscientific.co.uk/catalog/products/cd-dent-phantom?category-id=312>).

From the above-cited references, it is clear that the authors are incorrect in their statement.

Respectfully,

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