LETTER TO THE EDITOR

Author's reply: *In vitro* comparison of digital and conventional bitewing radiographs

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We thank Drs Aps, Berkhout and Goren for their interest in our recently published paper.¹ To briefly summarise our *in vitro* results, we found that the diagnostic quality of conventional film and digital images, which were exposed and viewed by a new wireless handheld unit, was comparable. This handheld unit has become especially advantageous in paediatric dentistry and has potential for use in nursing homes, humanitarian missions, forensic dentistry and with disabled patients.

Firstly, we want to emphasise that no consultants were involved in this study, and none of the authors received any fee paid directly or from any other financial agreement. Secondly, there is no doubt that nothing is more important than the safety of the operators and patients when using these kinds of devices. Thirdly, this study was not a technical report!

It is well known that the detection of approximal caries of primary teeth is difficult with the naked eye.² The proximal surfaces of teeth which can not be visually inspected must be evaluated by radiography.³ Traditionally, bitewing radiographs have been employed in addition to clinical examination of approximal surfaces.^{4,5} On the other hand, using radiographs in paediatric patients should be considered carefully. In paediatric patients, X-ray exposure should be reduced.⁶ Nevertheless, it has been advocated that 5-year-old children should be exposed to bitewing radiography for examination of approximal surfaces.^{7,8} By using these portable digital X-ray machines, children can be diagnosed radiographically and clinically in their dental units. Also, these portable digital X-ray machines can be used while children are treated under general anaesthesia or sedation. The system that we used in our study combines an X-ray source, digital radiography

sensor and computer processing in one completely portable and wireless hand-held unit.

In the conclusions section of the study, the recommendation that "further investigations should be performed, in order to determine safety and backscatter radiation dose of the handheld unit" could be added, as the reviewers stated. But, we do not have the same opinion as the reviewer that holding the device can never assure a safe distance behind the X-ray machine. We believe that parallel to technological progression, the digital X-ray machines will become smaller, portable and provide a very low radiation exposure to patient and operator. Moreover, it has been shown in a technical report,⁹ that the handheld battery-operated portable X-ray system presented no risk to the patient or to the operator, and measured doses were well below recommended levels.

In the Material and methods section of the study, reviewers affirmed that no soft tissue equivalent material was used in the setup of the study. We placed 14 mm dental wax in front of the teeth to simulate soft tissue, as Haak et al stated,¹⁰ and this was mentioned in the Materials and methods section of the study.

We thank again Drs Aps, Berkhout and Goren for their comments and we respect their criticisms, especially the recommendation that the safety of the handheld device is more important than image quality for operator and patient.

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