

## The importance of digital radiographic systems in dental schools and oral radiology centers as part of reopening during the COVID-19 pandemic

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Dear Editors,

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a non-segmented enveloped RNA virus of the coronavirus family, which is a group of genetically related viruses that includes SARS-CoV and a number of other coronaviruses isolated from bat populations. SARS-CoV-2 causes coronavirus disease 2019 (COVID-19), the clinical course of which culminates in acute respiratory distress syndrome.<sup>1,2</sup> The World Health Organization declared in January 2020 that the outbreak of COVID-19 comprised a public health emergency of international importance due to the spread of the disease throughout the world.<sup>3</sup> According to the Johns Hopkins Coronavirus Resource Center, the COVID-19 pandemic had infected more than 25,334,339 people worldwide by August 31, 2020, with more than 848,084 deaths.<sup>4</sup> To contain the spread of the infection, social isolation measures have been implemented in numerous countries.<sup>5</sup>

Currently, many countries around the world are adopting a phased approach to reopening. These initiatives have raised vitally important concerns regarding reopening strategies for dental schools and oral radiology centers, as it is necessary to identify and reduce risks, as well as to prevent cross-contamination, through the modernization of the workflow with digital images and teleconsultations, in order to contribute to the control of COVID-19 spread.<sup>1,6</sup>

For radiographic procedures, extraoral examinations should be prioritized to prevent spread of the virus, since during intraoral radiographic techniques the clinician

comes into contact with the patient's saliva, and there is a fairly high probability of coughing and occurrence of the gag reflex.<sup>7</sup> Software tools applied to digital panoramic radiographs allow the viewer to change the brightness, contrast, and magnification of the image, which can increase the diagnostic accuracy in comparison to conventional systems. Moreover, the possibility of carrying out extraoral bitewing radiography using digital panoramic devices must be taken into account, since this technique has been described as accurate for the diagnosis of proximal caries, with no statistically significant differences when compared to intraoral bitewing radiography.<sup>8</sup>

In situations requiring greater image sharpness to increase diagnostic accuracy, which is a need inherent to intraoral radiographs, digital radiographic systems using the parallelism method through an X-ray film positioner should be used, with care taken not to generate aerosols and droplets. These systems eliminate the need for a darkroom and chemical processing using a developer and fixer.<sup>9</sup> Previous research observed that microorganisms can remain present for up to 2 weeks in these liquids.<sup>10</sup> SARS-CoV-2 may persist on surfaces for a few hours or even several days depending on the temperature of the environment.<sup>11</sup> Additionally, as digital radiographic systems do not require the exam to be printed, this option should become the rule, with exceptions made in cases where the patient or professional has difficulty accessing the digital file. The use of digital images enables software tools to be used and provides a higher spatial resolution for diagnosis than is possible with printed images; furthermore, digital images can be stored and sent through virtual platforms,<sup>9</sup> avoiding the need for the patient and professional to come into contact with physical radiography film and paper, and making it unnec-

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essary for the patient to return to the radiology clinic to receive the results of the radiographic exam. However, as intraoral digital receptors are reused after each patient, strict biosafety and disinfection criteria must be followed before (having the patient gargle mouthwash containing chlorhexidine), during (placing the digital receptor in a plastic barrier) and after (wiping the digital receptor with mild-alcohol-impregnated tissue) radiographic examinations.<sup>12</sup>

In conclusion, digital extraoral radiographs (e.g., panoramic radiographs and extraoral bitewing radiographs) should be prioritized at the current moment when they are clinically indicated. Additionally, we emphasize that more countries should follow the trend of modernization of oral radiology as part of reopening during the COVID-19 outbreak. The use of digital radiographic systems and virtual platforms for the analysis, storage, and sending of images must be part of the protocol adopted for the return to professional activities at dental schools and oral radiology centers to reduce the risk of SARS-CoV-2 transmission.

**Conflicts of Interest:** None

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