Embracing A Successful Transition from Film to Digital Radiography

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The transition to digital radiography can be easier than many dental professionals may think. The skills acquired for film radiography are directly applicable to digital radiography. The primary differences are the receptor and utilization of computer technology. This article will present the basics of digital radiography as well as tips for a successful transition from film to digital radiography.

Digital radiography incorporates computer software, hardware, and digital receptors for the capture, display, and storage of radiographic images. Before a digital image can be acquired, a patient file must be created in the computer software and a survey template selected. Therefore, it is necessary for dental professionals to receive training to become familiar with the hardware and software utilized in digital radiography prior to “going digital.”

Intraoral Digital Receptors
Digital receptors include direct wired or wireless rigid sensors (Figure 1) and indirect photostimulable phosphor plates (PSP). These receptors are available in sizes comparable to film. Rigid sensors capture the image directly and the image can be viewed in real time on the monitor. PSP receptors are exposed as with film but require laser scanning before the image can be viewed on the monitor. PSP receptors are categorized as indirect due to the delay between exposure and image viewing.

Infection Control
Digital receptors cannot be heat-sterilized. As a result, disinfection and barrier techniques must be used to avoid cross-contamination during survey acquisition. Table 1 presents recommended infection control procedures for digital receptors. As a result of reported breaches in rigid sensor barriers, the Center for Disease Control recommends that rigid sensors be double covered to avoid saliva contamination during radiographic procedures.1-3 In addition, care must be taken to avoid cross-contamination to computer and/or scanning equipment used in

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<th>TABLE 1. Infection Control for Digital Receptors</th>
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<td>Procedures</td>
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<td>■ Pre-clean, disinfect, and cover work surfaces including x-ray head, exposure controls, computer equipment</td>
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<td>■ Prepare and double-cover rigid sensor or place PSP into barrier according to manufacturer’s instructions.</td>
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<td>■ With clean gloves, assemble instruments, place covered receptor into holder.</td>
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<td>■ With PPE*, place rigid sensor, expose, and view result. Retake as needed. Reuse sensor for next area.</td>
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<td>■ For PSP, use and expose separate plates for each projection.</td>
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<td>■ After each PSP view, remove receptor, wipe off saliva, and continue until survey is complete.</td>
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PSP Post Procedures
■ With gloves, disinfect PSP barriers.
■ With fresh gloves, drop plates out with exposure side down into plate carrier.
■ Carefully transport carrier and load plates into scanner.
■ View digitized images, complete retakes as needed.
■ Erase plates by exposure to white light.

Clean-up Procedures
■ With PPE in place, complete unit clean up including radiographic instruments and receptors.

*PPE – Personal Protective Equipment (clinical attire, gloves, mask, eyewear)
digital radiography. Foot or remote control devices and automatic advancement features help avoid cross-contamination.

**Image Acquisition**

Instruments are available to hold digital receptors during placement in the mouth (ie, XCP, DENTSPLY Rinn, Elgin, IL). Most instruments are designed for the paralleling technique, can be heat-sterilized, and are used like a film holder so placement is virtually identical. Film instruments can be used for PSP receptors while instruments for rigid receptors are designed for their thicker construction. Several universal holders are available for use with any rigid receptor. As with film, occasionally the patient will experience discomfort or gag during radiographic procedures. Tissue cushions can be used on the receptor edge to reduce discomfort; topical anesthetic agents or the distraction technique can be employed to moderate the gag reflex.

**The Benefits**

Digital radiography has many advantages over film radiography. Although exposure reduction and elimination of chemical processing are most often cited, additional benefits include the ease of image capture, viewing, storage, and duplication as well electronic image transfer for referral or insurance purposes. Digital images can be enhanced and enlarged which facilitate patient education and improve understanding of treatment recommendations. Digital imaging is more efficient than film radiography and the time saved can be reinvested in direct patient care. Finally, digital radiography has a “wow” factor that presents the practice as “high-tech” and on the cutting edge of dentistry.

**Radiographic Guidelines**

In 2004, the American Dental Association and the US Department of Health and Human Services updated *The Selection of Patients for Dental Radiographic Examinations.* The guidelines remain similar but include the expanded use of panoramic radiography for adult patients, addition of a clinical category for the assessment of restorative treatments and pathology evaluations, specific edentulous patient monitoring, and clarification on bitewing orientation. Bitewing examinations are the only time-based surveys recommended with intervals selected to reflect caries risk. Routine radiographs or surveys based on insurance reimbursement intervals do not conform to guideline principles. The dentist is advised to conduct a clinical examination, consider the health history, and prescribe radiographs only when the information gained is expected to affect patient treatment. The dentist is responsible for adherence to the ALARA principle (As Low As Reasonably Achievable) to minimize patient exposure. Compliance is achieved through selection of the fastest image receptor, patient lead shielding, and proper exposure and processing techniques. Digital radiography is mentioned as one means of reducing patient radiation exposure.

**Conclusion**

Digital imaging has many benefits that are advantageous to both the patient and clinician. Although there are some differences, infection control measures, imaging techniques, patient shielding, and patient management strategies are much the same as film radiography. These skills can be readily adapted to digital radiography.

**References**


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