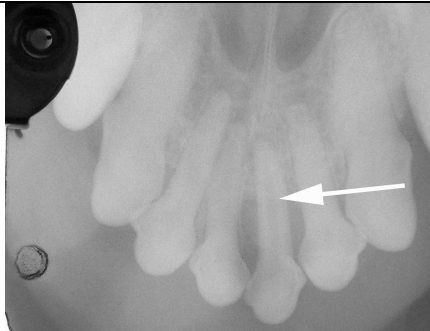
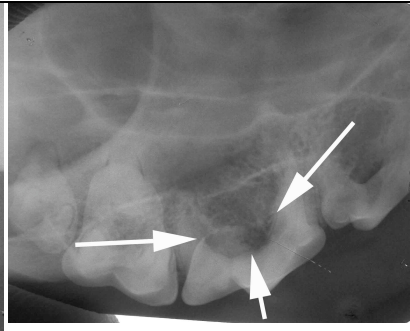
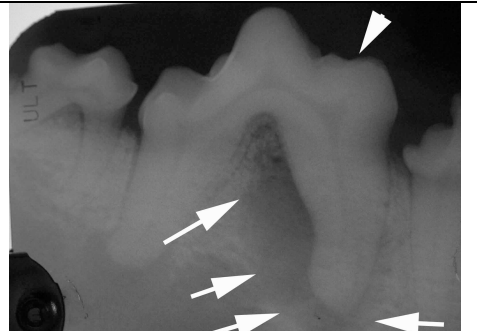


DENTAL RADIOLOGY

By Tony M. Woodward, DVM, AVDC

We continue in this article describing the five basic dental services that all general practitioners should be able to provide for their patients. In the last article we covered the 12-step cleaning process. This article covers dental radiology. Dental radiology is the core diagnostic modality for veterinary dental care. Trying to diagnose and treat dental disease without radiographs is like trying to treat ear disease without an otoscope, or diabetes mellitus without blood glucose measurements.

If a practice is not currently taking dental radiographs, they are sending many, if not most, of their patients home with painful dental problems. Unfortunately, the pets seem to act fine, they eat well according to the owners, and rarely do they show any overt sign that they are in pain. Many owners assume that because there is no obvious pain, there is no pathology. Many veterinarians assume that unless a tooth is loose, it does not require treatment. Nothing could be further from the truth. The accompanying dental radiographs all illustrate cases where non-mobile teeth in apparently normal patients are associated with significant pathology. When these types of problems are found and addressed, the patients typically act “years younger”, according to the owners. If you start taking dental radiographs and treating the hidden disease in your patients, you will likely find that the majority of your positive client comments are generated from your dental cases. The following examples illustrate cases in which proper treatment would not occur without dental radiographs.

		
<p>This radiograph of a discolored left upper first incisor shows an enlarged root canal system, indicating the tooth was dead and required treatment. No mobility was present.</p>	<p>This right upper fourth premolar had a small rough area along the palatal aspect of the gingival margin. The dental radiographs revealed destruction of most of the tooth under the gingiva. Although the crown seemed intact, the tooth required extraction.</p>	<p>This radiograph shows a large area of bone destruction (arrows) associated with a small cusp tip fracture (arrowhead). There was no exposure of the root canal system in this fracture. The exposed dentin in the fracture site allowed bacteria to migrate down the dentin tubules into the pulp chamber, resulting in an abscessed tooth. Despite the severe pathology, it might be <u>years</u> until this tooth was mobile.</p>

The cost for implementing dental radiology is minimal. New dental X-ray machines are available for around \$3000. Newer machines, such as the **Corix Pro 70 Veterinary Dental X-Ray**, feature solid-state timer systems, which allow use in a digital system. I would recommend avoiding older human dental X-ray units, as there can be issues with inconsistent exposure times and radiation scatter. An additional \$500 gets you a **chairside developing tank, film, film clips, and chemistry**. The chairside developer (Instaveloper) and chemistry (Insta-neg and Insta-fix) made by Microcopy are my favorite, and are available through Dentalaire. Most practices will be happiest using **D-speed X-ray film**, which provides high detail and is more forgiving of errors in exposure and processing. To save time, a small X-ray view box should be located next to the chairside developer. You should be able to pay for your entire dental radiology investment of around \$4000 in one month. You will realize income from the dental radiographs, as well as from the treatment of otherwise hidden pathology. What other area of veterinary medicine provides this kind of return?

A more recent advancement in dental radiology is the availability of digital systems, which eliminate the need for film and chemistry. Digital systems typically range from around \$6000 to \$16,000 in cost, and are rapidly becoming the standard in practice due to their time savings. Images are organized in a database, and must be backed up regularly to prevent loss of patient records. Some digital imaging software allows for the easy importing of high-quality pictures, printing of client letters with radiographs and pictures, and displaying images from the pet on a large screen in the exam room. Owners love seeing pictures and radiographs from their pet!

Two main types of digital systems are available today. DR systems includes a “sensor” and software, and are used with an existing dental X-ray machine and computer. The sensor is connected via USB cable to a computer, and is placed in the patient’s mouth and positioned like ordinary dental film. The largest sensor size currently available approximates the size of #2 dental film. Images are viewed in seconds, and may be digitally manipulated to heighten detail and minimize re-takes. The sensors are the most expensive part of the system, and although they are quite durable, care must be taken to prevent damage. CR systems involves the use of “phosphor screens”, which look similar to ordinary dental film. After exposure, the screens are fed into a scanner, which gives you an image in around one minute. The phosphor screens are exposed to bright light to erase the prior image, and can be re-used hundreds of times. This type of system is more expensive, but does have the advantage of being able to produce larger #4 films. The chart below compares various features of DR and CR systems. DR systems are currently more popular due to the speed with which you can obtain images.

The Dentalaire DTX digital dental system combines a proven sensor with state of the art software and excellent software support. The ease of use and flexibility of the software is rapidly making it a favorite in the veterinary dental community. See the DTX product section in the online catalog for more details. The DTX system gives you the ability to “Wow” your clients, and educate them about their pet’s care. Additionally, the software is easily integrated with virtually all practice management systems, PACS servers and DICOM systems on the market.

The idea of dental radiology is a new one for many practitioners and their clients. Acceptance of dental radiographs, does not magically occur after obtaining the requisite equipment, but rather
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depends on the practice implementing a number of steps. These steps include deciding what the practice stance is toward dental radiology, educating the staff and doctors in the use and value of the equipment, obtaining educational materials that the staff can deliver to the clients, and coordinating the delivery of your marketing message to your clientele (see the previous articles for more detail). This process involves change, which is painful. You will have to invest a few hours of time and staff training to achieve good results, but the rewards in improved patient health, client satisfaction, and practice revenue will be enormous.

System type	Hard wired sensor (DR)	Phosphor screen (CR)
<i>Sensor used</i>	Hard wired sensor (CCD or CMOS) attached to the USB port of computer	Radio-sensitive screens in plastic sleeves
<i>Number of use until replacements</i>	Indefinite	300-600 uses, then must be replaced
<i>Preparation for next use</i>	Sensor is automatically ready in 1-10 seconds	Screen must be “erased” using bright light, then placed into new sleeve.
<i>Ease of “Film” placement</i>	Sensors are stiff and thicker than normal dental film	Comparable to normal dental film
<i>Cost for sensor or phosphor plates</i>	\$6,000 to \$18,000, depending on brand	\$30-80 per phosphor plate
<i>Sensor sizes available</i>	Correspond to #0 and #2 dental film. <u>No #4 sensor at this time.</u> Some teeth require >1 view	Correspond to #0, #2, and #4 dental film. #4 screen allows larger teeth to be imaged in one view.
<i>Time until images can be viewed</i>	A few seconds.	60-90 seconds to remove plate from packet, feed film through scanner and replace screen into packet
<i>Quality of image</i>	Excellent, but can vary depending on the particular system.	Excellent.
Total system cost	\$6000-\$20,000 Plus computer	Approx. \$13,000 Plus computer

For those who still doubt that their clients will accept dental radiographs, I would point out the example of heartworm testing and prevention in my practice area. According to our own local heartworm survey results, our practice area has a minute incidence (less than 0.1%) of heartworm disease, yet most practices that choose to pursue heartworm prevention have achieved a high level of compliance. This is because heartworm testing and prevention was presented to clients as something that would benefit the pet. The disease was explained, the staff gave recommendations, and the doctors backed them up. In other words, heartworm prevention was “marketed” to the clientele of the practice. I estimate that half of your patients require some form of dental care, and that most dogs and cats over the age of six years have at least one painful dental problem in their mouth. Most of these painful teeth have no mobility, and will only be diagnosed through dental radiography. It should be much easier to market a service that occurs in most of your patients versus a disease that rarely occurs. It is just a matter of what you believe, and how you communicate this to your clients. I have worked with dozens of practices all over the country, helping them implement dental radiology. I have yet to find one practice, regardless

of size, location, or socioeconomic status of their clientele that has failed to successfully implement dental radiology if they tried it.