DIQUAD, LLC

Better Image Quality—
Lower Patient Dose

D- versus E-F- or F-Speed Dental Films

D-speed film is the slowest film requiring the highest radiation dose to the patient. Changing from D- to E-speed film will result in a 30-40% reduction in patient radiation dose, after adjusting the exposure time appropriately. Changing from E- to F-speed film will produce a 20-25% reduction in patient dose. Switching from D- to F-speed film will result in a patient dose reduction of about 60%. (FDA 2009)

E-F-speed is also available. One manufacturer states that their E-F-speed film is an F-speed film when processed in a roller-transport automatic film processor. (Carestream 2011) If this film is processed manually, it is an E-speed film.

There have been concerns in the past that the E-speed films exhibited more grain and less contrast than the D-speed films. However, in 1994 the traditional pebble-shaped silver halide grains were replaced with tabular grains resulting in similar appearance of both types of film. (Ludlow 1997; Wong 2002) It is clear that images using D- and E-F-speed film (Figure 1) are quite similar in appearance. (Gray 2011a)

Figure 1. Intraoral images of the same patient with D-speed (top 240 mrad) and E-F-speed (bottom, 140 mrad) dental films.

Approximately 80% of the dental facilities in the US that use film use D-Speed film, which results in unnecessary radiation dose to patients. (CRCPD 2003) By comparison, only 8.6% of the facilities in a recent survey in the United Kingdom use D-speed film. (Horner 2011)

The American Dental Association (ADA, 2006) recommends the exclusive use of E-F- or F-speed film in order to reduce the radiation dose to dental patients by a factor of two. This recommendation is in

agreement with the recent recommendations of the National Council on Radiation Protection and Measurements. (NCRP 2003; NCRP 2011) In addition, the NCRP is recommending a diagnostic reference level (DRL) of 1.85 mGy for all dental intraoral imaging regardless of film speed or type of image sensor. Furthermore, American Academy of Maxillofacial Radiology also recommends the use of the higher speed (E- or F-speed) film. (Preece 1983; Goren 2000)

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