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Brighter Smiles

More on Dental x-Rays –Part 2

I had a few more questions on dental x-rays and will continue this week with answering those.

Because of the location of a local dentist office, I used to live and work in a room next to the room containing the dental x-ray machine. Was I being exposed to radiation? Exposure rates decrease rapidly with distance. Ordinary walls generally provide sufficient shielding for these machines. In fact, it has been considered "safe" for operators of these machines to be in the room as long as they were at least six feet from the x-ray tube. In fact, as I described a couple of weeks ago, I have a dental x-ray unit that is portable (looks like a speed radar gun) and actually requires the operator to stay in the room when taking an x-ray. It is FDA approved and considered absolutely safe. If you received any exposure, which is unlikely, it would be an insignificant amount.

I had several dental x rays taken recently and am now having problems with my gums feeling hot and, in some areas, getting sores. Is it possible the dental x rays caused this? The amount of radiation needed to cause biological effects is several hundred times higher than can be received during dental radiography. Because of the design of these x-ray machines, there is a limit to the amount of exposure possible during the procedure. Diagnostic dental radiation doses are very small and not known to cause biological effects of the type you describe or any other type.

What is the radiation dose difference between using standard film for a dental x ray and using digital radiography? For intraoral radiographs (film packets placed inside the mouth) such as bitewings and periapicals, there are several types of film available at different speeds, meaning that they require different amounts of exposure to produce an image. This is a concept similar to photographic film speeds, with higher numbers requiring less light. A typical skin exposure for Group D film (ultraspeed) is about 300 mR, for Group E (Ektaspeed) about 150 mR, and for Group F (Insight) about 110-120 mR.

One digital-imaging manufacturer recommends setting the exposure for its equipment at about 20% of D-speed film, or about 60 mR. Another study found a 31-39% decrease compared with E-speed film for a different particular sensor. Some institutions have found that approximately a 50% decrease from F-speed film provides a good image.

One of the reasons that there is not much published on the specific amount of dose reduction is that most digital systems can use a fairly wide range of exposure times and then use software adjustments to provide a good image. It is possible that digital imaging may require as much exposure as film if the user does not consciously reset the x-ray machine to lower exposure or if the x-ray machine timer cannot accommodate the short exposure times (usually an old machine, not the current models).

With respect to digital panoramic radiographs, there appears to be no dose reduction compared with film-based panoramic images because there is already a large dose reduction as a result of use of intensifying screens in the panoramic cassettes.

Dr. St. Clair maintains a private dental practice in Rowley and Newburyport dedicated to health-centered family dentistry. If there are certain topics you would like to see written about or questions you have please email them to him at jpstclair@dentalhealthforlife.com. You can view all previously written columns at www.dentalhealthforlife.com.