

# NOT ANOTHER DENTAL X-RAY AGAIN?

HOW MANY TIMES HAS THIS THOUGHT GONE THROUGH your head every time you visited a dentist? Why do dentists seem to be fixated with taking these tiny sized radiographs (or "dental x-rays") over the same areas year after year? You might even be wondering if you are getting excessive radiation from all these x-rays?

Perhaps you were too shy to ask your dentist to ask such questions - but you should have! Not only will you be assured that the radiation risk is negligible, but you will be glad that your dentist did you a big favour by performing all those dental radiographs, and possibly saving you a lot of grief, time and money on more complex, expensive dental procedures. Dental radiography is an important subset of the range of diagnostic procedures every dentists have at their disposal. Often, a properly taken dental radiograph(s) clinches the diagnosis.

Teeth are rather unique structures with a sizable portion constantly soaked in a wet and bacterial filled environment. The bulk of the tooth comprises of the root submerged under your gums and inside your jaw bone. Decay can easily begin at the weaker part of the hard tooth structure rather than the hardest (enamel) portion. The initial signs of such a decay pattern or a root canal infection are usually difficult to detect and diagnose, unless a dental x-ray called a bitewing or periapical radiograph is taken. Only then can a dentist see what is hidden to him clinically, and thus advice and act with the patient accordingly.

## THE RADIATION DOSE

So is all that "radiation" really excessive? For a meaningful comparison of radiation risk, the radiation exposures

TABLE 1: IONIZING RADIATION DOSAGES (APPROXIMATE)

Activity	Effective Dose in $\mu\text{Sv}$	Dose as Days of equivalent background radiation
1 day background radiation, sea level	7-8	1
1 digital periapical/bitewing radiograph	6	1
Kodak Cone Beam CT (anterior, focused)	4.7	0.71
Kodak Cone Beam CT (upper jaw, focused)	9.8	1.4
Kodak Cone Beam CT (lower jaw, focused)	38.3	5.47
Chest X-ray	170	25
Mammogram	700	106
Medical CT Scan (head)	2000	243
Medical CT Scan (spiral abdomen)	10000	1515
US Federal Occupation Safety Limit Per year	50000	7575



are converted to exposure dose – and are measured in Sieverts (Sv). A Sv is a large amount so we measure them in microSieverts ( $\mu\text{Sv}$ ). Comparisons can be performed with respect to natural background radiation. *Typically, a person at sea level gains 7-8 $\mu\text{Sv}$  of background radiation daily. This is the amount of average background radiation you get everyday of your life.* If you were at the beach that day, having fun in the sun, the amount is of course higher. The average annual effective dose from background radiation in the United States is about 3000 $\mu\text{Sv}$ .

So it is rather obvious (see Table 1) that radiation dosages for dental related x-rays are really minimal – it can even be less than a day's worth of background radiation. Considering that most people regard chest X rays and mammograms as somewhat "routine" diagnostic procedures, this should go some way to alleviate any anxiety you may have about the risk of excessive radiation for dental radiography.

## THE BENEFITS

Dental radiographs not just provides us with low risk, highly effective means of diagnosing decay, gum disease, root canal related diseases – they are also required medical-legally to document the various stages of dental health and disease. For example, before an endodontist (a dentist who specialises in root canal treatment) commences treatment, a pre-operative (before treatment) radiograph, and at least another post-operative (after completion of treatment) is required. This is even if the diagnosis is obvious. In fact, the endodontist is also likely to recall the said patient in about 6 months (and 12 months later sometimes), with dental x-rays taken at each of these short reviews. This is to assess and document that the initial disease has healed uneventfully.

Dental radiography have gone progressively digital in a big way, negating the need for messy developing solutions, long processing time, and as earlier mentioned – at much lower radiation dosages. *Digital images can be shown on large computer screens and facilitate patient education and understanding.* The digital images can also easily be reproduced if it has to be read by another dentist or practice at another location.

Cone Beam CT (CBCT) is another new technology that many modern dentists are harnessing to produce 3D digital images of the jaw structures. CBCTs are increasingly being indicated when patients have complex dental treatment plans (eg multiple dental implants, difficult root canal or oral maxillo facial diagnosis). It is a big boon to dental patients that dentists are now able to see deep, small spaces and structures inside patients jaws without subjecting them to another 243 days of background radiation (ie a CT scan of the head) like they used to.

*In short, digital dental radiography and its use in routine diagnostic dental procedures cannot be separated from the practice of good dentistry.* These dental radiographs provide important and meaningful information in diagnosis, treatment planning and disease prevention. To reject a needful dental radiograph is no different from asking your dentist to treat you blindfolded.

The next time you visit a dentist and he says you need to take a dental radiograph, ask not if you need one, but if you need to take more! Might just be another day at the beach. ■

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