



Dental X-Rays – Information on Benefits & Risks for Patients

(Produced by Graham Hart, our Radiation Protection Adviser)

Dental X-Ray Equipment

Dentists may use different types of x-ray equipment – from simple devices used to take an image of the structure of a single tooth to panoramic or a specialist type of CT scanner used to take more detailed images of the mouth or jaw. The equipment is used to diagnose conditions that may not be apparent from a visual examination.

Radiation Dose

All types of equipment send an x-ray beam through the mouth to create an image on a piece of film or digital media. Whilst much of the x-ray beam goes onto the film or plate, some of the energy is absorbed in the body. This is the radiation ‘dose’ that we would receive from the examination. The dose can be expressed in a number of different ways, but perhaps the most common is the ‘Sievert (Sv)’. Because diagnostic x-ray examinations uses relatively small doses (particularly so in dentistry), these doses are usually stated in ‘milliSievert (mSv)’ – one thousandth of a Sievert.

Dose & Risk

We receive a small radiation dose all the time from a range of natural sources – including the sun and stars; the things we eat and drink; common building materials; and the earth and rocks. This background radiation dose is on average about 2.7mSv per year in the UK, but varies considerably from place to place, being over 7mSv per year in Cornwall, for example.

As seen from the table below, the additional dose received from a dental x-ray examination is very small and has negligible influence on the theoretical risk of the radiation triggering a cancer.

Examination	Effective Dose (mSv)	Theoretical cancer risk	Equivalent time of average UK background
Dental Bitewing X-Ray	0.005	1 in 4,000,000	16 hours
Panoramic (‘OPT’) X-Ray	0.02	1 in 1,000,000	3 days
Lumbar Spine X-Ray	0.7	1 in 30,000	over 3 months
CT Brain Scan	3	1 in 6,500	more than 1 year
CT Body Scan	20	1 in 1,000	8 years

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By comparison, 1 in 2 people born in the UK after 1960 will be diagnosed with cancer during their lifetime (source: Cancer Research UK).

Legislation & Standards

Nevertheless, the use of x-rays in dental practices is subject to strict sets of regulations and professional standards in the interests of both patient and staff safety. Amongst many other things, they cover:

- Ensuring x-rays are only performed when necessary – they need to be fully justified
- Installation, maintenance & testing of x-ray equipment to ensure it continues to function correctly
- Appointing an external expert (the practice's Radiation Protection Adviser / Medical Physics Expert) to advise on patient and staff safety and to check that the equipment produces consistent quality images whilst keeping radiation doses at an acceptable level.

Dental X-Rays & Pregnancy

The dental x-ray beam is small, highly directional and of course is never directed towards the abdomen. The radiation dose the patient receives is not transmitted by the circulation. The consequence of all this is that it is entirely safe to have a dental x-ray during pregnancy, so there is no need for the dentist to ask the pregnancy status of someone having a dental x-ray.

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