

At Reveal Diagnostics we adhere to the radiation principal ALARA, As Low As Reasonably Allowable. Our Planmeca Promax Max CBCT is the only one in commercial imaging that uses low-level "dental" radiation (below 100 kVp). The below charts and studies indicate the radiation exposure of our scans, compared to other exposure levels of natural, dental, and medical radiation.

| <b>Radiation Source</b>               | <b>Effective dose exposure<br/>(uSv, ICRP 2007)</b> | <b>Reveal Scan Type</b>  | <b>Hours of<br/>air flight</b> | <b>Dental film<br/>x-rays</b> | <b>Day of US<br/>exposure</b> |
|---------------------------------------|---|--------------------------|--------------------------------|-------------------------------|-------------------------------|
| Average daily background exposure, US | 8.5   | Promax CBCT, Focus Area  | 4                              | 9                             | 11                            |
| Dental bitewing x-ray, digital/F-film | 9   | Promax CBCT, Lower Skull | 5                              | 12                            | 15                            |
| Average daily total exposure, US      | 17  | Promax CBCT, Full Skull  | 6                              | 15                            | 19                            |
| Dental bitewing x-ray, D-speed film   | 22  |                          |                                |                               |                               |
| One hour of high-altitude air flight  | 50  |                          |                                |                               |                               |
| X-ray, Chest                          | 100   |                          |                                |                               |                               |
| X-ray, Skull                          | 100   |                          |                                |                               |                               |
| Dental FMX (18), digital x-ray        | 171   |                          |                                |                               |                               |
| <b>Promax CBCT, Focus Area</b>        | <b>192</b>  |                          |                                |                               |                               |
| <b>Promax CBCT, Lower Skull</b>       | <b>260</b>  |                          |                                |                               |                               |
| <b>Promax CBCT, Full Skull</b>        | <b>324</b>  |                          |                                |                               |                               |
| Dental FMX, D-speed film              | 388   |                          |                                |                               |                               |
| X-ray, Mammogram                      | 420   |                          |                                |                               |                               |
| X-ray, Hip                            | 700   |                          |                                |                               |                               |
| CT, Head                              | 2,000   |                          |                                |                               |                               |
| X-ray, Lumbar Spine                   | 6,000   |                          |                                |                               |                               |
| X-ray, Abdomen                        | 7,000   |                          |                                |                               |                               |
| CT, Chest                             | 7,000   |                          |                                |                               |                               |
| CT, Abdomen                           | 10,000  |                          |                                |                               |                               |
| CT, Cardiac                           | 20,000  |                          |                                |                               |                               |

| <b>Radiation and Cancer</b>                        | <b>uSv (2007 ICRP)</b> |
|--|------------------------|
| Highest dose allowable by US radiation worker      | 50,000                 |
| Lowest dose likely linked to increased cancer risk | 100,000                |
| Lowest dose to cause non-fatal radiation sickness  | 1,000,000              |

**Correlation between medical/dental x-rays and cancer**

"In epidemiological studies of humans, no actual increase in cancer incidence has ever been found in groups of humans who have received effective doses below 100,000 uSv. The effective doses associated with dental exposures are much, much smaller than this." - Health Physics Society

A study of 4,000 patients indicated that "patients with thyroid cancer had received the same number of diagnostic x-rays, including dental x-rays, as the general population," concluding "not much association between medical x-rays and cancer."

**Sources**

- (1) Planmeca Promax Max CBCT data: Planmeca internal physicist report, 2011
- (2) Medical radiation levels: American Nuclear Society (<http://www.ans.org/pi/resources/dosechart/>)
- (3) Dental xray radiation levels: Journal of American Dental Association, Sept 2008;139(9):1237-43.
- (4) Daily exposure to radiation: Int. J. of Dentistry, Apr 2012 (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3324904/>)
- (5) Exposure during air travel: US Environmental Protection Agency (<http://www.epa.gov/radtown/cosmic.html>)
- (6) Radiation and cancer, US Nuclear Regulatory Commission (<http://www.nrc.gov/about-nrc/radiation/health-effects/high-rad-doses.html>)
- (7) Medical x-ray and cancer correlation: Health Physics Society (<http://hps.org/hpspublications/articles/dentaldoses.html>)