

## Radiation safety with dental hand-held x-rays

ADA states<sup>1</sup> that: “Studies of legally marketed devices found that radiation exposure was within safety limits<sup>2,3</sup> and, in fact, were significantly less than for wall-mounted systems.”

ICRP states<sup>4</sup> that: “A limit on effective dose of 20 mSv/year, averaged over 5 years (i.e., a limit of 100 mSv in 5 years) with the further provision that in any single year the effective dose should not exceed 50 mSv”.

Radiologyinfo.org<sup>5</sup> states that Head CT-scan is 2mSv.

Remedi Remex T-100 studies<sup>6</sup> states that exposure to operator is between 0 and 0.007 $\mu$ Sv (diagram 1) depending where the operator stands. Compared to Head CT scan, operator would have to take 285,000 exposures to dose same amount of radiation than 1 single patient Head CT scan.

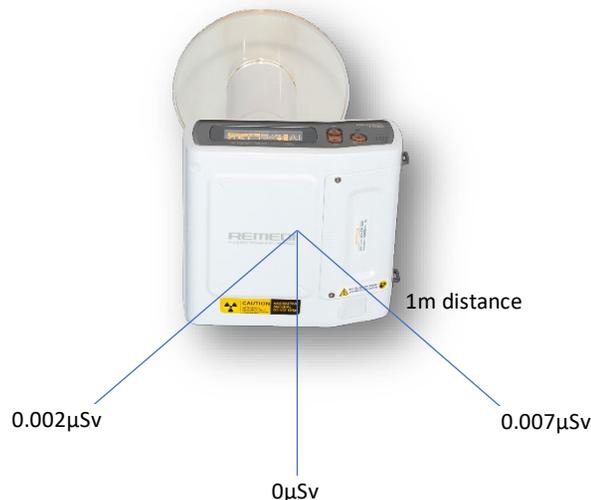
ImageWisely.org<sup>7</sup> states that: “although background Radiation levels vary greatly by the region, in average, Head CT equals 8 months of earth’s background radiation”. Comparing the Head CT scan patient dose to Remedi Remex operator dose, 1x Remedi Remex exposure equals to 190,000 years of background radiation.

Perception of risk by Professional Society<sup>7</sup>.

Handguns was rated No 1, X-rays in general was ranked 24. In between are activities such as motor vehicles, alcohol, surgery, pesticides, aviation, contraceptives, police and fire fighting, football, and skiing.

*This article was not written to lessen the dangers of radiation, but to compare test results from different studies and to put perspective of radiation dose to handheld x-ray operator.*

Diagram 1.  
Remedi test results



1. <https://www.ada.org/en/member-center/oral-health-topics/x-rays>
2. Mahdian M, Pakchoian AJ, Dagdeviren D, et al. Using hand-held dental x-ray devices: ensuring safety for patients and operators. J Am Dent Assoc 2014;145(11):1130-2
3. Gray JE, Bailey ED, Ludlow JB. Dental staff doses with handheld dental intraoral x-ray units. Health Phys 2012;102(2):137-42.
4. [https://www.remm.nlm.gov/ICRP\\_guidelines.htm](https://www.remm.nlm.gov/ICRP_guidelines.htm)
5. <https://www.radiologyinfo.org/en/info.cfm?pg=safety-xray>
6. Remedi measurement report REM-MR20190513
7. <https://www.imagewisely.org/Imaging-Modalities/Computed-Tomography/How-to-Understand-and-Communicate-Radiation-Risk>