The use of handheld x-ray devices is a growing trend in the practice of dentistry. They are beneficial in several circumstances where portability is favorable; however, several questions of safety for the operator have surfaced regarding backscatter radiation, leakage, and adequate distance or shielding of the clinician.

Repetition of exposure, accumulated radiation dose, and distance from the source of radiation are all important concerns of the dental professional operating the device. The thyroid is one of many sensitive tissues that are affected by radiation.

Due to the sensitivity of the thyroid, two surveys were conducted to determine if there was a correlation with thyroid dysfunction and the primary x-ray units used. Results from these two surveys echoed the idea that thyroid disease is a major health issue in the United States; yet it is uncertain if repetitive exposure to low-dose radiation is a contributing factor to the prevalence of these diseases. Additional testing and statistical data is required to reveal if there is any correlation between the two.

A case study was also conducted that lasted for 2 months evaluating the exposure levels of the clinician when operating a hand-held x-ray device. Results from these 2 months matched the research on exposure levels to operators when using these devices. The exposure levels were very low and well under the maximum exposure levels deemed safe by the National Council on Radiation Protection and Measurements (NCRP) and the International Commission Radiologic Protection (ICRP).

In order to better protect the operator and ensure safety from radiation exposure, the use of personal dose-meters and protective shielding such as a lead apron with a thyroid collar is recommended. Operator positioning is key to utilize the safety features of the device, and in addition, clinicians should ensure that these devices are cleared by the FDA by checking for certification and warning labels on the device itself.


