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**Exposure of X-Radiation to the Hands of Dental Professionals Who Hold Film for Uncooperative Dental Patients.**  
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**Purpose:** When taking dental radiographs it is recommended that the operator stand behind a suitable barrier, or at least 6 feet from and at an angle of 90 to 135 degrees to the central beam. However, this is not always possible when treating uncooperative pediatric dental patients. The aim of this study was to measure the radiation exposure to the hands of the dental professional stabilizing the head and /or holding the film for an uncooperative patient.

**Methods:** Bitewing, anterior occlusal, and posterior periapical radiographic examinations were simulated on a RANDO phantom head, using a Gendex 770 x-ray machine operated at 7 mA, 70 kVp, 14 impulses and a 30 cm source-film distance. Measurements of exposure were made with a recently calibrated MDH 1015 x-ray monitor with a model 10X5-6 ion chamber positioned at 20 locations around the phantom. For each position and each type of radiographic examination, 3 cycles of 5 exposures each were made and averaged. Measurements were made with both a round (6.5 cm diameter) and a rectangular (3.5 x 4.5 cm) collimator, both with and without a latex radiation-attenuating glove (0.018 mm lead equivalency), and at two distances from the head. Select data were subjected to the paired-samples t-test.

**Results:** Radiation exposure varied significantly with the location of the dosimeter probe and the type of examination. The highest recorded exposure (40.02 mR, equivalent to 426  $\mu$ Sv) occurred at the skin surface at the level of the lips during the maxillary anterior occlusal examination. The operator could hold the film here 1173 times per year and still stay within the recommended annual maximum permissible dose of 500 mSv. The measurements 10 cm from the surface of the skin were an average of 90% lower than those at the surface ( $p < .0001$ ). Switching to a rectangular collimator reduced the recorded exposure by 76% ( $p < .0001$ ), while use of the radiation-attenuating glove reduced it by 33% ( $p < .0001$ ).

**Conclusion:** The dose to the hands when exposing radiographs on an uncooperative patient is low. This dose can be decreased dramatically by using a hemostat or other film-holding device to keep the hands out of the primary beam, a rectangular collimator in place of a round, and radiation-attenuating latex gloves.