

roentgens delivered per milligram-minute of exposure, assuming that milligram-minutes are equal to $\frac{1}{2}$ the product of the milligrams of radium used and the length of time required for its insertion.

For the hands the average value obtained was 18×10^{-4} r/mg.-min. and for the body 4.2 Gm. r/mg.-min. The significance of these figures, of course, will vary with different radiologists depending on individual skill and the number and type of patients treated. On the basis of the single radiologist studied (one session of three cases per week or 665 mg.-min. of average exposure per week) the total radiation to the body was less than one-tenth the minimum acceptable British dose, namely, 0.1 r per day. The situation in the case of the hands is complicated, since there is no accepted tolerance dose. In the situation cited the hand dose is $1\frac{1}{2}$ times the total body tolerance value. Much higher localized doses, e. g., to the tips of the fingers, probably occurred.

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SOME CASES OF RADIATION INJURY IN RADIOLOGICAL WORK. S. HULTBERG, L. E. LARSSON AND L. EKLUND, *Acta radiol.* **33**:376 (March-April) 1950.

In Sweden all lesions due to radioactive substances must be reported to the Institute of Radiophysics. The radiation injuries that have been brought to the attention of the institute have been of two kinds: local injuries and blood damage.

The obligation to report suspected radiation injuries is not always observed, and hence exact statistics on their incidence cannot be given. The National Insurance Board, which deals with cases in which compensation is claimed for loss of income through industrial disease or accident, dealt with only about 20 cases of presumed radiological injury during the period 1941 to 1949. Decisions have not yet been reached in five of these cases. Compensation was authorized in three fourths of the others, whereas in the remaining fourth it was found that the injuries could not have been caused by radiation.

The authors present the histories of eight patients who sustained radiation injuries. The first of these patients was a nurse who in her daily work was holding patients for the photographing of extremities and skull and who thus presumably had her fingers exposed to primary radiations. After her fingers began to show signs of atrophy and slight desquamation, she became more careful and did work in which her fingers were exposed to roentgen rays only a few times each month. The radiation injury reappeared, however, in a more aggravated form despite this reduced exposure. The skin began to peel off, and ulcers appeared on the fingers. She was then completely removed from radiological work, and the sores healed; even the desquamation ceased, although the atrophy still remained. The second and third patients were a clerk who was employed in miniature mass radiography and a dentist. The fourth was an engineer who was working with an x-ray diffraction apparatus and on one occasion had made an adjustment on the x-ray tube in which the anode was not well centered. He thought that while doing this he exposed his left hand to primary radiation. About three weeks later, three fingers of this hand showed an erythema, which later started to weep copiously. After the lesion healed, he carried on with roentgen work, but although he did not expose his hands to primary radiation, he noticed an increasing atrophy of the skin on the injured fingers. Later, blisters appeared on the same fingers, which soon broke down into sores. After three months this lesion was completely healed, but later the pain in the three fingers, especially the ring finger, again returned, and reddish areas appeared on these fingers in which the skin was atrophied. There was complete epilation in the atrophied areas. The danger in work with x-ray diffraction apparatus is understandable in view of the great dosage rate at the window (in this case about 1,000 r per second). The fifth patient whose case is reported was a nurse who sustained a radiation injury while working with radium.

The remaining three patients sustained radiation injuries while undergoing reduction of fractures.