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ACCIDENTAL EXPOSURE TO HIGH ENERGY ELECTRONS

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In a serious radiation accident, a victim was exposed to radiations in the vicinity of an electron beam from a 10 Mev industrial linear accelerator. Immediately after the accident and throughout a subsequent reconstruction of it, dosimetric information was assembled which proved of great value to the attending physician in understanding the course of physiological changes occurring in various parts of the victim's body.

The dose gradient about the primary electron beam was high, giving estimated doses to various parts of the hand which ranged from 240,000 to 40,000 rad. The skin on the front and right surfaces of the trunk of the body received an estimated dose of 300 rad. The back and left surfaces of the trunk received very little radiation. These circumstances determined the body surface available for skin grafting.

The interior of the body received doses ranging from 0.2 to 5 rad. These dose levels, arrived at by accident reconstruction, were consistent with estimates made immediately after the accident, which were based on bremsstrahlung formation in the skin of the chest from a highly scattered electron beam. The early estimate gave great hope for survival since the victim's blood-forming tissues would not have been badly damaged.

The early reaction on the patient's hand suggested a much lower dose than physical dosimetry and later physiological reaction indicated. This episode has suggested a variety of approaches to future laboratory research.

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