

Radiation Protection

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The discovery of X rays brought with it the immediate recognition that this previously unknown form of energy would be of inestimable value in medicine for diagnostic purposes. In his first communication, Wilhelm Rontgen referred to having made X-ray pictures of the bones of the hand, and on New Year's Day 1896 sent reprints of this paper to several prominent scientists of the day along with samples of X-ray pictures.^{1,2} Thus the radiograph of his wife's hand found its way to the Weiner Presse and was published along with the first public announcement of the discovery on 5 January 1896.³ Although of poor quality relative to the standards of even of a few months later, this early radiograph, which also appeared in the first English translation of Rontgen's article, clearly showed the bones of the hand and a large ring on the third finger. Thus it is not at all surprising that X rays were used for diagnostic purposes (and possibly for therapy, if the accounts of Grubbe are to be believed) within a matter of weeks after the announcement of the discovery.^{4,5}

Given the near ubiquitous fascination with X rays and the virtually immediate and widespread application to medicine, it was inevitable that X-ray injuries soon would appear and with them a recognition of the hazard and the need for protective measures. In fact, the most important principles for X-ray protection were known during the first decade after the discovery.⁶ Radiation protection measures and philosophy have undergone a dynamic evolution over the years, as has been described by a number of authors, and can be related in terms of four successive chronological periods, derived by combining the eras in radiology put forth by Grigg and those in radiation protection of Kathren and Ziemer:^{7,8}

- 1) The Era of the Protection Pioneers (1895-1915), marked by the initial recognition of hazards and the development of the earliest protective measures by a small cadre of prescient pioneers.
- 2) The Golden Age of Radiology (1915-1940), noteworthy not only as a time of great progress in the medical application of X rays and radioactivity but for the beginnings of established units of measurement and organized official efforts in radiation protection.
- 3) The Golden Age of Protection (1940-1960), during which the scientific and technical bases of modern radiation protection were developed and the profession of health physics was born.
- 4) The Modern Era (1960-1995), characterized by growth and complexity in medical applications of X rays and radioactivity and new modalities, coupled with intensified concern and regulation of all things radiological.