

Radium Dial Painter Dosimetry: Person-Centered Innovations

N.E. Martinez^{1,2}, D.W. Jokisch^{2,3}, C. Samuels², R. Leggett², S. Tolmachev⁴, M. Avtandilashvili⁴, G. Tabatadze⁴, R. Goans⁵, L. Dauer⁶, J. D. Boice, Jr.^{7,8}

¹*Clemson University*; ²*Oak Ridge National Laboratory*; ³*Francis Marion University*; ⁴*United States Transuranium and Uranium Registries*; ⁵*MJW Corporation*; ⁶*Memorial Sloan Kettering Cancer Center*; ⁷*Vanderbilt-Ingram Cancer Center*; ⁸*National Council on Radiation Protection and Measurements*

Current progress in radium dial painter (RDP) dosimetry within the Million Person Study is discussed along with our initial community engagements and public collaborations. Although dose reconstruction is often approached as a 'pure' science, the importance of people, relationships, and stories should be center stage. Progress in RDP dosimetry is a true collaborative effort between multiple generations of scientists as well as the RDPs themselves and their family and friends. Current work builds on the innovation and foresight of those who came before us some 100 years ago and draws on the recorded experiences of the dial painters coupled with community knowledge. The person-centered approach adopted in this work is two-fold: (1) recognition and incorporation of prior personal experience and scientific accomplishments and (2) improving individualized dose determination as practical and possible. For the latter, approaches include use of individual measurements at multiple times following chronic intake of radium; applying reference models corresponding to an individual's age at exposure and length of exposure; improvements to age and sex dependent models (particularly for females); evaluation over the lifetime of workers; consideration of intake rate by workplace and workplace practice; and potential incorporation of biodosimetry. The overarching goal is to enhance the understanding of lifetime risk from intakes of radionuclides for this classic epidemiologic study (Martinez et al. IJRB 2022)* which has been foundational for radiation protection guidance from the Manhattan Project to the present. The humanity of the young girls and women studied as early as 1915 will not be forgotten.

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