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Dosimetry of 125I Glia Site brachytherapy using Monte Carlo method

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Purpose: One of the applications of 125I, is used to treat brain tumors by injection technique of radioactive liquid inside the balloon Glia Site in the former site of the tumor which has been surgically implanted. In this treatment the activity utilized is in the range of several hundred mCi, so patients and medical personnel dosimetry in this technique is very important.

Materials/methods: Dose in the tumor and in the sensitive tissue around that in the period of treatment was calculated when the balloon containing iodine is placed in the tumor. A Glia Site balloon was considered in diameter of 1.5 cm which filled 125I liquid source. The simulations in this research are carried out at all stages with the MCNP code and the VIP phantom was used (figure 1).

Results: We obtained the duration of treatment to reach the prescribed dose (60Gy in 2mm depth) to the tumor, which for the activity 200mCi was about 8.4 days. In figure 2, iso-doses were shown that related to the balloon of 125I Liquid in the head. Absorbed dose for healthy tissue in white matter, gray matter and eye lens were calculated 9.12, 5.07 and 0.51 mGy, respectively.

Conclusions: Glia Site brachytherapy with 200-300mCi of 125I Liquid can be obtained the prescribed dose into the tumor.

Key words: brachytherapy, GliaSite, Dosimetry, 125I, brain tumor, Monte Carlo

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Aging and magnetism: presenting a possible new holistic paradigm for ameliorating the aging process and the effects thereof, through externally applied physiologic picotesla magnetic fields

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A new holistic paradigm is proposed for slowing our genomic-based biological clocks (e.g. regulation of telomere length), and decreasing heat energy exigencies for maintenance of physiologic homeostasis. Aging is considered the result of a progressive slow burn in small volumes of tissues with increase in the quantum entropic states; producing desiccation, microscopic scarring, and disruption of cooperative coherent states. Based upon piezoelectricity, i.e. photon-phonon transductions, physiologic PicoTesla range magnetic fields may decrease the production of excessive heat energy through target specific, bio molecular resonant interactions, renormalization of intrinsic electromagnetic tissue profiles, and autonomic modulation.

Prospectively, we hypothesize that deleterious effects of physical trauma, immunogenic microbiological agents, stress, and anxiety may be ameliorated. A particle-wave equation is cited to ascertain magnetic field parameters for application to the whole organism thereby achieving desired homeostasis; secondary to restoration of structure and function on quantum levels. We hypothesize that it is at the atomic level that physical events shape the flow of signals and the transmission of energy in bio molecular systems. References are made to experimental data indicating the aspecific efficacy of non-ionizing physiologic magnetic field profiles for treatment of various pathologic states.

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