12. PROSPECTS OF NEUTRON CAPTURE SYNOVECTOMY AT THERMAL NUCLEAR REACTORS

A. N. Berlizov, V. F. Razbudey, Yu. B. Shevchenko, V. V. Tryshyn

Evaluative dose calculations were performed for the irradiation of a human knee-joint with neutrons at a horizontal channel of the WWR-M nuclear research reactor. It was shown that therapeutic dose of 100 Sv, necessary for the destruction of a pathological synovial membrane of an inner joint capsule at Reumatoid Arthritis, can be delivered in several minutes if a boron compound is injected into the capsule before irradiation. Evaluated doses on other tissues of a joint were found to be one order of magnitude lower than permissible levels. Neutron filters and reflectors are supposed to be used for forming necessary neutron spectrum and obtaining adequate neutron flux at the irradiation position. The calculations were done by the Monte Carlo method on the assumption that the content of ^{10}B in a synovial membrane was 1,9 %. From the results obtained a conclusion was drawn about the possibility of creation of an irradiating facility for Neutron Capture Synovectomy (NCS) on the basis of the nuclear research reactor with no alterations in its construction or operating mode.