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## Investigation of neutron dose rate from 15 MV photon beam in Clinac iX medical accelerator at Kien Giang Oncology hospital

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The photon beams in Radiotherapy are shaped by some components of the LINAC head such as collimators, flattening filter, MLCs, etc., which are made of heavy metals. Because the threshold for photon-neutron reaction of heavy materials is about 7 MeV, photon beams with energies of 10, 15, and 18 MV in clinical applications are capable of generating unwanted neutrons. These unwanted neutrons need to be taken into account because they cause a high Relative Biological Effect (RBE) that even a small amount can cause harm to patients as well as medical staffs. This work was performed to investigate the neutron dose rate and its attenuation at several locations in the LINAC vault for photon beam 15 MV emitted from Clinac iX medical accelerator. A portable neutron survey meter was used to measure the neutron dose rate at 12 different locations in the LINAC vault, where the patients were delivered by prescribed dose and the radiotherapists often appeared after beam off. Results revealed that the neutron dose rate distribution was not the same at the measurement locations, moreover, it was not decreased to zero immediately after beam off, but declined over time.

**Presenter:** ., Vũ Ngọc Tú

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