

ABSTRACT

The Global Cancer Observatory (GLOBOCAN 2022) reported 408,661 new cancer cases and 242,988 cancer-related deaths in Indonesia in 2022. As part of the efforts to prevent and control cancer in Indonesia, the Ministry of Health has developed the National Cancer Plan 2024–2034, which focuses on six strategic areas. One of these strategies is improving access to cancer care and management, from diagnosis through palliative care. Supporting the government's initiatives outlined in the National Cancer Plan, Eka Hospital has established the Eka Tjipta Widjaja Cancer Center (ETWCC), equipped with Proton Beam Therapy (PBT) technology, also known as a proton therapy system. Radiation protection for proton therapy facilities presents a significant challenge. Proton therapy generates secondary radiation in the form of neutrons and photons due to interactions between the proton beam and various components of the treatment machine. This study presents the radiation shielding design for the proton therapy system to be installed at Eka Hospital BSD. The shielding design was modeled using Monte Carlo simulations and the workload method. The Monte Carlo simulation results showed that the annual effective dose in all areas surrounding the proton therapy room was less than 0.5 mSv per year. Therefore, it can be concluded that the proposed shielding design is safe and meets the required radiation protection standards.

Keywords : *radiation shielding, proton beam therapy, Monte Carlo*