

ABSTRACT

A dose calibrator is a measuring instrument used in a critical process of nuclear medicine services, specifically for determining the activity of radionuclides or radiopharmaceuticals to be administered. To ensure the performance of the dose calibrator, quality assurance procedures must be implemented, one of which is linearity testing. Measurements were conducted using the Capintec CRC-55tR device. The procedure involved activity decay using a Tc-99m radionuclide source with an initial activity of 105 mCi, performed over a period of three days with data collection intervals of one hour. The obtained values were then evaluated against theoretical calculations, as well as the recommended values from IAEA TECDOC 317 and AAPM TG 181. The results were also compared with measurements reported in several other studies. Based on the findings, the linearity of the dose calibrator complied with the recommended tolerance limit of $\pm 5\%$ for each measurement. Furthermore, the plotted graph showed an R^2 value of 1 with a maximum deviation of 0.142%. The comparison between the measured activity values and the values calculated using the half-life method indicated accurate results, with a maximum difference of 0.36%. This value is smaller than those reported in several other studies, indicating a higher level of accuracy of the measuring instrument used in this study.

Keywords : *Dose calibrator, Linearity testing, Quality assurance, Activity decay method.*