

ABSTRACT

Quality control (QC) on CT scanners is mandatory to ensure image quality according to BAPETEN standards. This study aims to analyze the trends of central CT number accuracy, noise uniformity, and CT number uniformity on a GE 32 Slice CT scanner over a 22-month period.

This was a longitudinal observational study with a descriptive quantitative approach conducted over 22 months (July 2024 – April 2026). Data were analyzed using descriptive statistics (mean, standard deviation, minimum, maximum) and compared with the BAPETEN Regulation No. 2 of 2022. Routine calibration performed every October and room temperature maintained at 20–22°C were also analyzed.

The results showed that all data met BAPETEN standards. Center image CT number accuracy ranged from -2.14 to 1.28 HU (mean -1.49 HU), with a standard of ± 5 HU. Noise uniformity ranged from 0.027 to 0.462 HU (mean 0.159 HU), with a standard of ≤ 2 HU. CT number uniformity ranged from 0.16 to 0.87 HU (mean 0.48 HU), with a standard of ≤ 2 HU. The maximum noise uniformity value (0.462 HU) reached only 23% of the BAPETEN limit. Routine calibration improved CT number uniformity (71% improvement) and center image CT number accuracy (47% improvement). In conclusion, the GE 32 Slice CT scanner demonstrated good performance, meeting BAPETEN standards throughout the study period. Routine calibration every October played a role in maintaining all parameters within tolerance limits despite monthly fluctuations. The maintained room temperature (20–22°C) contributed to the stability of all three parameters.

Keywords: CT Scan, quality control, CT number accuracy, noise uniformity, CT number uniformity, BAPETEN.