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Clinical elements

Advanced molecular imaging

Digital PET/CT complies to EANM Research Ltd (EARL) accreditation specifications

Purpose of study

The purpose of this study was to evaluate if Digital PET/CT could fulfill EANM Research Ltd (EARL) accreditation specifications for tumor imaging with FDG-PET/CT. The following is a summary of the study, "Digital PET Compliance to EARL Accreditation Specifications", by Koopman et al., that appeared in the European Journal of Nuclear Medicine and Molecular Imaging Physics[1].

Overview

In an effort to standardize scanners and medical centers, the European Association of Nuclear Medicine (EANM) has published guidelines on FDG-PET tumor imaging[2,3]. The EANM also launched EARL to promote nuclear medicine research, and has developed an accreditation program for tumor imaging with FDG-PET/CT[4]. These specifications, around activity concentration recovery coefficient measurements on PET images, were based on Analog PET systems using conventional photomultipliers[2,3].

To ensure compliance of fully digital PET/CT to EARL specifications, the authors performed a phantom study using a NEMA NU2-2001 image quality phantom with six fillable spheres. Phantom preparation and PET/CT acquisition were performed according to the EANM guidelines.

Results

- The use of relatively large 4 x 4 x 4 mm3 voxels and a post-smoothing filter is recommended to meet EARL standards for PET/CT
- Smaller voxel sizes and/or PSF modeling resulted in activity concentration recovery coefficient above EARL specifications, reflecting higher contrast

PET with digital photon counting technology typically shows an activity concentration recovery coefficient above EARL specifications, especially for small objects.

Conclusion

Digital PET/CT can fulfil the EARL accreditation specifications for tumor imaging with FDG-PET/CT.

References

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