

EARL FDG-PET/CT accreditation program: Feasibility, overview and results of first 55 successfully accredited sites

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Objectives: Quantitative multicenter PET/CT studies are hampered by variability in methodology. Therefore, in 2010 the EANM published a guideline for FDG PET tumour imaging, which addresses (1) patient preparation, (2) FDG dosage as function of scanner type, patient weight and scan duration, (3) data acquisition, (4) image reconstruction, (5) data analysis and (6) quality control (QC) procedures. The guideline specifically aims at harmonizing quantification in multicenter studies. QC experiments are defined along with harmonizing criteria. To our best knowledge the EANM guideline is the first with harmonizing performance standards.

Methods: To implement the guideline EARL (EANM Res Ltd) started an accreditation program in June 2011, after successfully completing a pilot study. The program is set up in collaboration with and endorsed by the EORTC. In Q4/2012 55 sites have been included. Accreditation involves: (1) verification of PET/CT calibration and uniformity using a uniform cylinder and (2) assessment of SUV recovery (IQ QC) using a modified NEMA NU2 2007 phantom. Each 3 months calibration QC and each year IQ QC are repeated.

Results: All sites met calibration accuracy requirements, i.e. within 10% without (visible) image artifacts. QCs for assessing SUV recovery allowed for harmonizing scanner performance to within the harmonizing standards. In about 20% of the sites, recalibration or adjustment of reconstruction settings was needed to achieve harmonized PET/CT performance.

Conclusions: The first 1.5 years of the program showed the feasibility and successful execution of the EARL FDG PET/CT accreditation program in a multicenter setting. Retrospective analysis of clinical data collected in a Dutch trial demonstrated good correspondence in baseline SUV between sites that were performing PET studies in accordance with the guideline, while SUV differed almost 2 fold for a site that did not comply.