

Transitioning to Digital PET-CT – Early Experience and Protocol Optimisation from Multi-Site UK Network



Dedicated to Diagnostics

P120

Statement of Purpose:

Alliance Medical (AML) introduced four new digital Omni Legend 16 PET-CT mobile systems by GE HealthCare, first in UK. This work aimed to optimise acquisition and reconstruction protocols by benchmarking against existing digital systems within the network and comparing these with established PET-CT practice, while supporting development of an educational framework to aid rapid clinical familiarisation.

Methods:

Protocol optimisation was informed using patient datasets and structured phantom studies across several AML sites. Digital datasets were reconstructed using Q.Clear (Bayesian penalised likelihood modelling) with β -values of 600 and 800, combined with medium strength Precision DL (Deep Learning) in line with manufacturer recommendations. Analogue comparators use Q.Clear 400. Images were independently reviewed by several PET-CT reporters from across UK, with qualitative assessment of image quality, lesion conspicuity and noise. Quantitative behaviour, including SUVmax, was explored using both clinical and phantom data.



Summary of Results:

Digital reconstructions using intermediate β -values with medium-strength Precision DL demonstrated improved image smoothness and lesion conspicuity compared with other digital and analogue acquisitions, maintaining clinically acceptable quantitation. Reviewers reported greater consistency across cases and improved confidence when assessing small or low-contrast lesions. Phantom studies supported these findings, demonstrating favourable contrast-to-noise characteristics with the selected reconstructions.

Conclusion:

Combining clinical and phantom data enables effective optimisation of digital PET-CT protocols on Omni Legend 16 mobile scanners. The outputs will support structured education to harmonise practice, accelerate training and enhance confidence during transition to digital PET-CT implementation on mobiles serving multiple AML sites. And we are rolling this out at other sites and other scanners in partnership with local providers.

References

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2. Mehranian A, et al. Deep learning-based time-of-flight (ToF) enhancement of non-ToF PET scans for different radiotracers. *Eur J Nucl Med Mol Imaging*. 2025;52:2968-2978. doi: [10.1007/s00259-025-07119-z](https://doi.org/10.1007/s00259-025-07119-z)

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