

PET quality control (QC)

Written technical QC procedures were submitted to each center. Staff and equipment questionnaires for each center had to be filled out on a webserver by a physicist. An electronic logbook was implemented for each center to report quality control and scheduled/corrective maintenance results. The data were (i) quality controls required by the manufacturer, (ii) quarterly image uniformity and cross-calibration, (iii) image quality control, at baseline and after the manufacturer's maintenance, and (iv) quarterly Hounsfield Units (HU) calibration for CT.

Image uniformity was evaluated with a cylindrical phantom filled with homogeneous FDG solution. Relative standard deviations (the ratio of standard deviations from the mean value of several regions of interest) were computed on all slices (except the first and last slices to avoid border effect) and had to remain $\leq 10\%$. Considering all the centers, the overall mean value was 6.3% (maximum: 9.5%, standard deviation: 1.8%).

To evaluate the calibration between the dose-calibrator and PET system, images of a cylindrical phantom filled with a known FDG concentration were acquired. The relative error between the actual and measured concentrations (the average value computed on each slice) had to be $\leq 10\%$. Considering all the centers, the overall mean value was 1.9% (maximum: 6.7%, standard deviation: 1.7%).

The image quality was evaluated with NEMA IEC Body phantom. VA50¹ was measured for each sphere of the phantom. Relative error for each sphere volume VA50 was then used as a metric. Except for the two smallest spheres, standard deviation estimated at all the centers remains low (Figure Annexed).

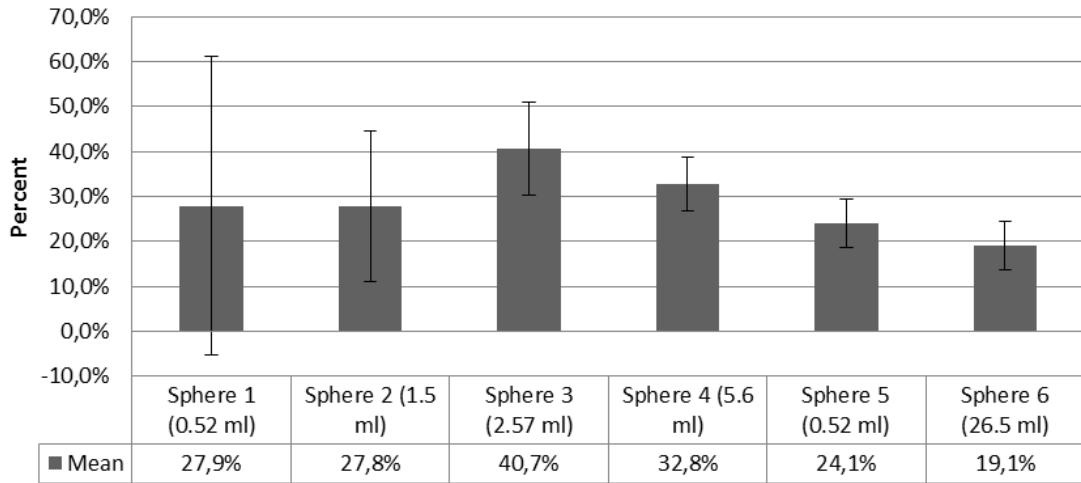
In Hounsfield units, the mean value measured in a water phantom must be $0 \pm 4\text{HU}$.

The PET imaging centers completed more than 500 reports on the webserver, with good homogeneity in the QC results. Ten PET imaging centers applied and were accredited by EARL.

Figure annexed: Quality controls: for each sphere, the mean value of the relative error computed for each volume VA50, all centers included.

¹ Boellaard R, O'Doherty MJ, Weber WA, Mottaghy FM, Lonsdale MN, Stroobants SG, et al. FDG PET and PET/CT: EANM procedure guidelines for tumour PET imaging: version 1.0. *Eur J Nucl Med Mol Imaging*. 2010;37(1):181-200.

Segmentation relative error for each sphere



Supplemental Figure 1.