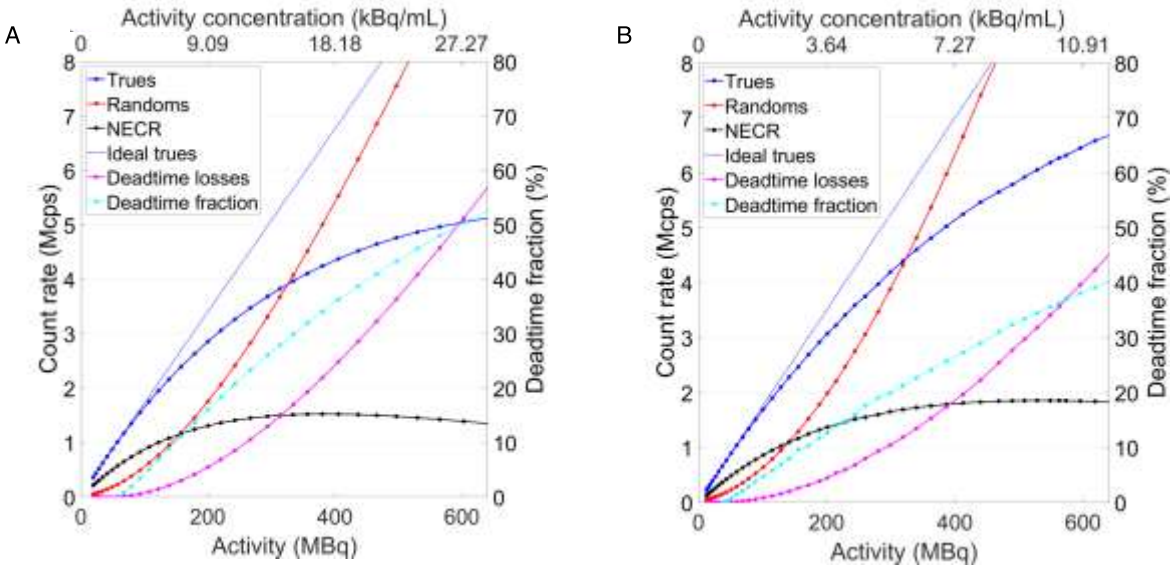
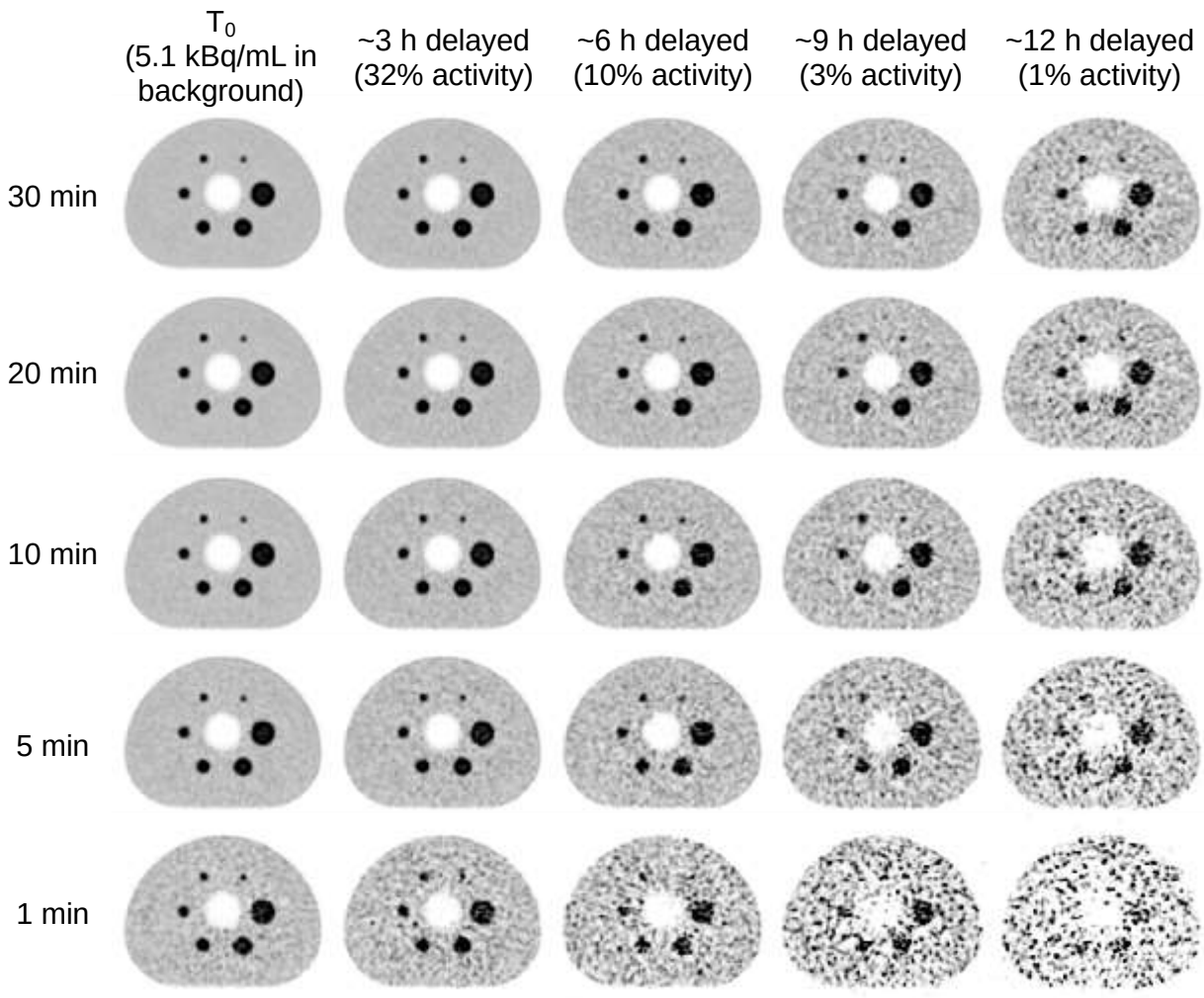


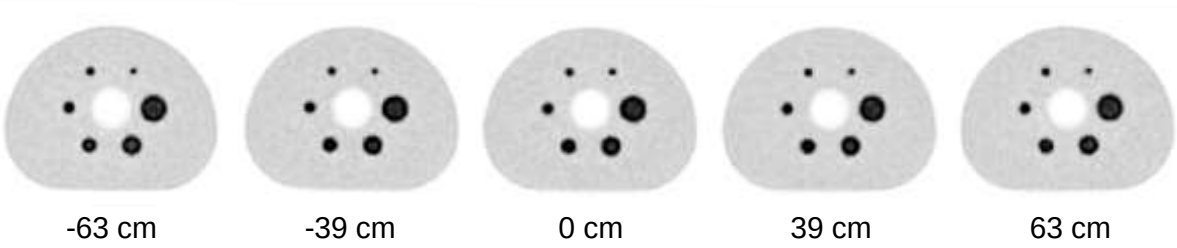
Supplemental Figure 1 - Measured count-rates and deadtime losses as a function of total ^{18}F activity with the (A) 70 cm-long scatter phantom with a volume of 22 L and (B) the 175 cm-long scatter phantom with a volume of 55 L. The ideal trues count-rate is estimated from a linear fit to the trues rate at low activities when deadtime affects are negligible, deadtime losses are then the difference between the ideal and measured trues in Mcps, and the deadtime fraction is the fractional deadtime loss relative to the ideal trues count rate.

Supplemental TABLE 1. Specifications of the NEMA image quality scans performed at the center of AFOV to assess the effect of sphere-to-background ratio on contrast recovery.

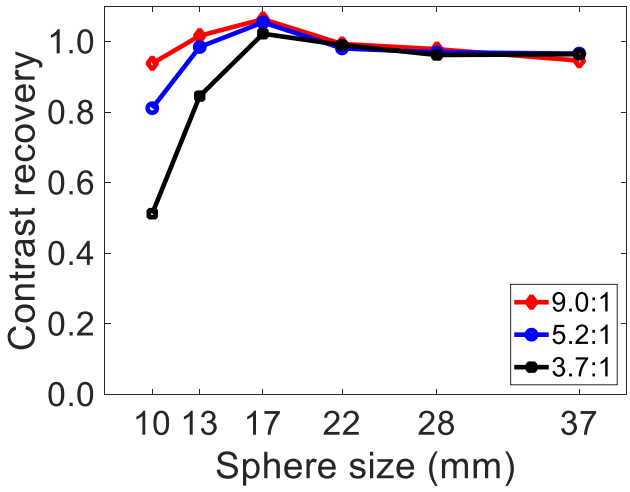
Sphere-to-background ratio	Background activity concentration (kBq/mL)	Scan duration (min)
3.7:1	5.1	30
5.2:1	4.5	30
9.0:1	4.5	30



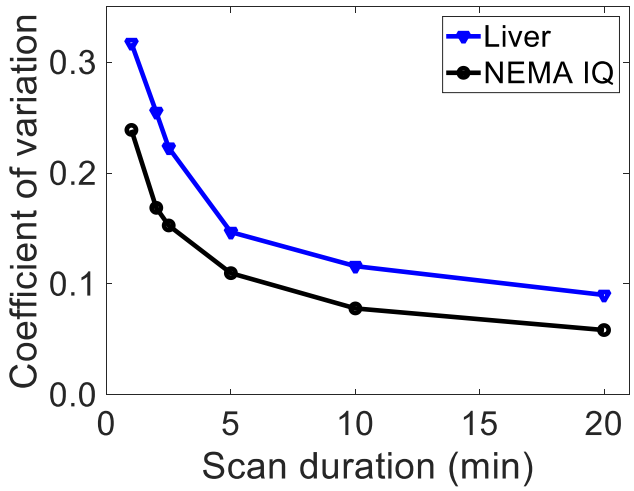
Supplemental Figure 2 – Transaxial image slices of a 30-min scan of the NEMA IQ phantom at the center of AFOV at several imaging timepoints, compared to reduced scan durations of 20, 10, 5, and 1 min. All images were reconstructed using the clinical image reconstruction protocol (2.34-mm isotropic voxels, 4 iterations) with PSF modelling and they were decay corrected to be shown using the same color scale: 0 – 20 kBq/mL. The phantom was filled with a sphere-to-background ratio of 3.7:1 and had background activity concentration of 5.1 kBq/mL at the start of the scans.



Supplemental Figure 3 – Transaxial image slices of the NEMA IQ phantom scanned at five axial positions throughout the AFOV. The offset from the center of AFOV is shown below each image indicating the scan position. All images were reconstructed using the clinical image reconstruction protocol (2.34-mm isotropic voxels, 4 iterations) with PSF modelling and they were decay corrected to be shown using the same color scale: 0 – 27 kBq/mL. The phantom was filled with a sphere-to-background ratio of 5.2:1 and had background activity concentration of 4.5 kBq/mL at the start of the scans.



Supplemental Figure 4 – Contrast recovery measured in the NEMA IQ phantom for different sphere-to-background ratios. The contrast recovery measurements in the phantom filled with 9.0:1 sphere-to-background ratio were slightly affected by presence of an air bubble in the largest sphere. All images were reconstructed using the clinical image reconstruction protocol (2.34-mm isotropic voxels, 4 iterations) with PSF modelling.



Supplemental Figure 5 – Coefficient of variation (CV) of a 37-mm diameter spherical ROI placed in the patient liver and in the NEMA IQ phantom background and reconstructed with shortened scan durations. The average activity concentration measured from the image of the patient liver was 3.64 kBq/mL, compared to 3.56 kBq/mL for the NEMA IQ background.