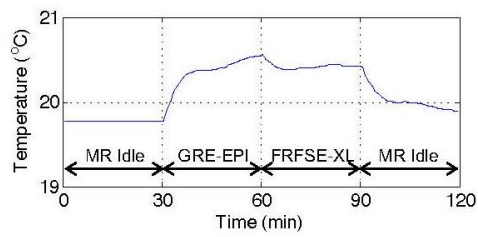
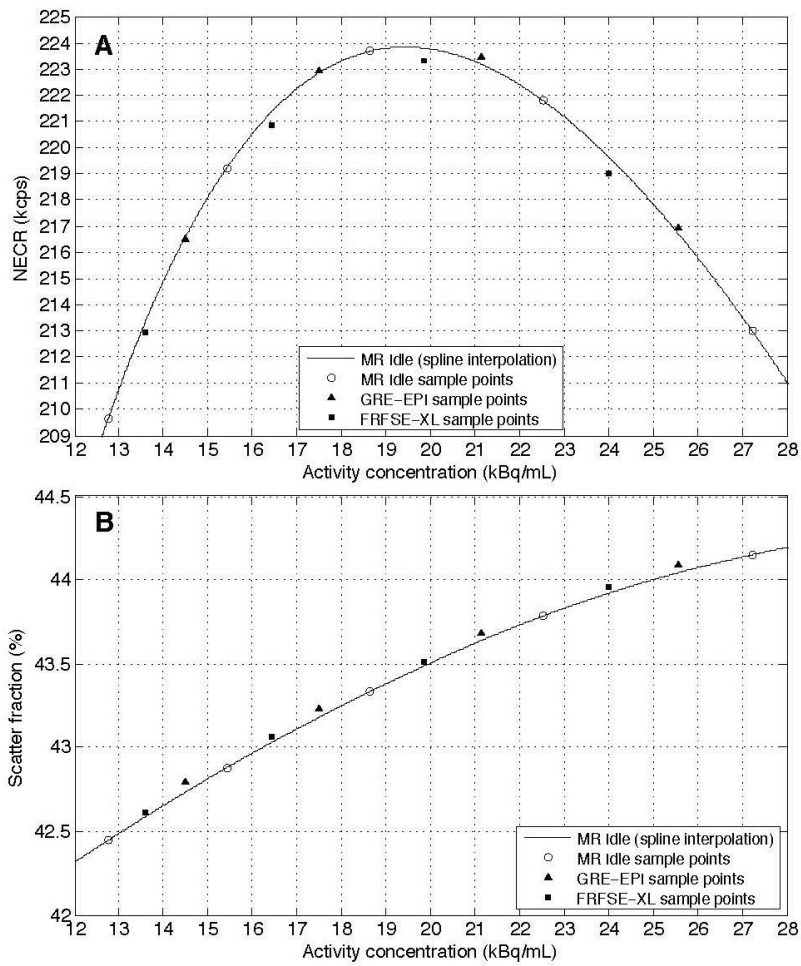


SUPPLEMENTAL FIGURE 1. ROI placement for the NEMA image quality analysis. The background ROIs are shown with 37 mm diameter; the smaller ROIs are placed concentrically.



SUPPLEMENTAL FIGURE 2. PET detector temperature versus time for the ^{68}Ge uniform phantom test.



SUPPLEMENTAL FIGURE 3. Zoom-in of the (A) NECR and (B) scatter fraction curves in the range of peak NECR. In each plot, the solid curve was generated with spline interpolation from the MR idle sample points. The GRE-EPI and FRFSE-XL sample markers are shown to compare with the interpolated MR idle curve.

SUPPLEMENTAL TABLE 1. Contrast recovery, background variability, and lung residual error (referred to as “accuracy of attenuation and scatter corrections” in the NEMA standard) for the 30-min bins, presented in order of acquisition (left to right).

	MR idle	GRE-EPI	FRFSE-XL	MR idle
Contrast recovery (%):				
10 mm, hot	61.3	62.0	62.0	61.6
13 mm, hot	66.7	66.3	67.2	66.0
17 mm, hot	73.7	72.8	72.6	72.9
22 mm, hot	81.4	82.3	83.2	80.8
28 mm, cold	88.7	88.6	87.3	89.5
37 mm, cold	95.5	95.9	95.2	95.7
Background variability (%):				
10 mm	4.1	3.8	5.3	4.7
13 mm	3.0	2.8	4.2	3.9
17 mm	2.4	2.1	3.1	3.4
22 mm	2.0	2.0	2.4	2.9
28 mm	1.7	1.9	2.1	2.4
37 mm	1.7	1.6	1.7	1.9
Lung region error (%):				
Lung region error	2.5	2.3	2.4	2.1

SUPPLEMENTAL TABLE 2. Contrast recovery, background variability, and lung residual error (referred to as “accuracy of attenuation and scatter corrections” in the NEMA standard) for the 10-min bins, presented in order of acquisition (left to right).

	MR idle			GRE-EPI			PRFSE-XL			MR idle		
Contrast recovery (%):												
10 mm, hot	61.9	61.6	60.1	64.1	62.5	58.9	63.8	58.9	63.0	60.9	62.8	60.7
13 mm, hot	68.9	68.9	68.1	64.6	67.4	67.2	65.9	68.1	67.3	70.3	66.6	66.7
17 mm, hot	74.4	74.1	72.1	73.0	73.2	72.0	70.2	74.0	73.9	76.0	70.1	72.1
22 mm, hot	82.0	81.1	80.8	82.7	80.8	83.2	83.3	84.2	81.9	80.7	81.2	80.4
28 mm, cold	88.6	88.9	87.3	87.5	89.1	88.2	85.5	86.6	88.7	89.2	89.1	89.2
37 mm, cold	95.6	95.6	94.7	95.3	95.2	95.4	95.0	95.2	94.6	95.4	94.9	95.0
Background variability (%):												
10 mm	5.9	7.7	5.8	5.9	6.9	6.8	9.1	7.3	7.4	7.3	8.1	7.9
13 mm	4.5	5.5	4.7	4.3	5.2	4.8	7.0	5.9	6.1	5.9	6.3	6.0
17 mm	3.7	4.0	3.9	3.3	4.1	3.2	4.9	4.7	4.7	4.8	4.8	4.5
22 mm	2.8	3.3	3.3	2.8	3.8	3.0	3.6	3.4	3.7	3.8	3.8	3.6
28 mm	2.1	2.7	2.7	2.3	3.2	2.8	2.9	2.7	3.1	2.9	3.2	3.1
37 mm	1.9	2.2	2.5	1.9	2.5	2.0	2.3	2.1	2.3	2.2	2.3	2.8
Lung region error (%):												
Lung region error	2.7	3.0	2.6	2.6	2.6	2.8	2.7	3.1	2.6	2.4	2.6	2.6

SUPPLEMENTAL TABLE 3. The NECR test included 16 PET frames that were acquired during MR pulsing. For each of these frames, the measured NECR is shown along with the corresponding spline-based interpolation using only the “MR idle” data points. The absolute and percent difference are shown.

Activity concentration (kBq/mL)	MR state	Measured NECR (kcps)	Spline fit from MR idle (kcps)	Difference (kcps)	Percent difference
37.3	GRE-EPI	183.3	182.7	-0.6	-0.31%
35.0	FRFSE-XL	189.5	190.1	0.6	0.31%
30.9	GRE-EPI	203.4	203.0	-0.3	-0.17%
29.0	FRFSE-XL	207.8	208.4	0.6	0.28%
25.6	GRE-EPI	216.9	216.7	-0.2	-0.10%
24.0	FRFSE-XL	219.0	219.7	0.6	0.29%
21.1	GRE-EPI	223.5	223.2	-0.3	-0.13%
19.9	FRFSE-XL	223.3	223.8	0.5	0.23%
17.5	GRE-EPI	223.0	222.8	-0.1	-0.05%
16.4	FRFSE-XL	220.9	221.3	0.5	0.22%
14.5	GRE-EPI	216.5	216.5	0.0	0.01%
13.6	FRFSE-XL	213.0	213.3	0.4	0.17%
12.0	GRE-EPI	205.6	205.6	0.0	0.00%
11.2	FRFSE-XL	200.6	201.1	0.4	0.22%
9.9	GRE-EPI	191.0	191.1	0.1	0.03%
9.3	FRFSE-XL	185.4	185.7	0.3	0.15%